THE PSYCHOLOGICAL DISORDERS FOLLOWING THE MAXILLOFACIAL TRAUMA

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF

THE DEGREE **MCh. PLASTIC AND RECONSTRUCTIVE SURGERY** EXAMINATION

OF THE DR. M.G.R MEDICAL UNIVERSITY, TAMILNADU,

CHENNAI TO BE HELD IN AUGUST 2015

CERTIFICATE

This is to certify that the dissertation entitled "THE PSYCHOLOGICAL DISORDERS FOLLOWING THE MAXILLOFACIAL TRAUMA" is a bonafide work done by Dr. Aashish Sasidharan, Christian Medical College, Vellore, Tamilnadu in partial fulfillment of the University rules and regulations for award of degree, MCh. Plastic and Reconstructive Surgery, under my guidance and supervision during
the academic year 2012 – 15.

Signature:

Dr. ASHISH KUMAR GUPTA
(GUIDE)
Professor and Head
Dept. of Plastic and Reconstructive Surgery, CMC, Vellore
Dated:

Signature:

Principal/Dean
Christian Medical College, Vellore
Dated:

CERTIFICATE

This is to certify that the dissertation entitled "THE PSYCHOLOGICAL DISORDERS FOLLOWING THE MAXILLOFACIAL TRAUMA" is a bonafide original work of Dr. Aashish Sasidharan, Christian Medical College, Vellore towards the MCh. Plastic and Reconstructive Surgery, Degree Examination of the Tamil Nadu Dr. M.G.R University, Chennai to be conducted in 2015.

Signature:

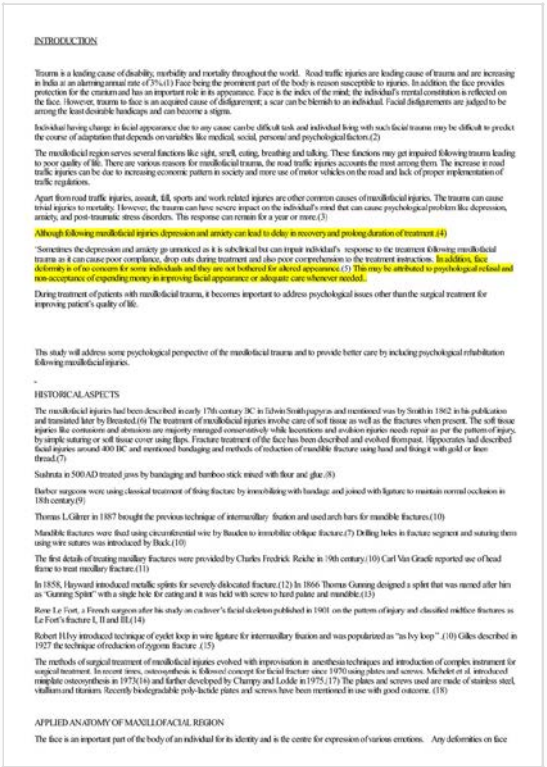
Dr. Aashish Sasidharan
Candidate, Resident
Department of Plastic Surgery,
CHRISTIAN MEDICAL COLLEGE,
Vellore - 632004.

Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	181213141. Mch Plastic Surgery Dr…
Assignment title:	TNMGRMU EXAMINATIONS
Submission title:	The psychological disorders follow…
File name:	Turnitin_edit.htm
File size:	81K
Page count:	31
Word count:	11,065
Character count:	60,609
Submission date:	27-Mar-2015 10:28AM
Submission ID:	521055459



INTRODUCTION

Trauma is a leading cause of disability, morbidity and mortality throughout the world. Road traffic injuries are leading cause of trauma and are increasing in India at an alarming annual rate of 3%.(1) Face being the prominent part of the body is reason susceptible to injuries. In addition, the face provides protection for the cranium and has an important role in its appearance. Face is the index of the mind; the individual's mental constitution is reflected on the face. However, trauma to face is an acquired cause of disfigurement; a scar can be blemish to an individual. Facial disfigurements are judged to be among the least desirable handicaps and can become a stigma.

Individual having change in facial appearance due to any cause can be difficult task and individual living with such facial trauma may be difficult to predict the course of adaptation that depends on variables like medical, social, personal and psychological factors.(2)

The maxillofacial region serves several functions like sight, smell, eating, breathing and talking. These functions may get impaired following trauma leading to poor quality of life. There are various reasons for maxillofacial trauma, the road traffic injuries accounts the most among them. The increase in road traffic injuries can be due to increasing economic pattern in society and more use of motor vehicles on the road and lack of proper implementation of traffic regulations.

Apart from road traffic injuries, assault, fall, sports and work related injuries are other common causes of maxillofacial injuries. The trauma can cause trivial injuries to mortality. However, the trauma can have severe impact on the individual's mind that can cause psychological problem like depression, anxiety, and post-traumatic stress disorders. This response can remain for a year or more.(3)

Although following maxillofacial injuries depression and anxiety can lead to delay in recovery and prolong duration of treatment.(4)

"Sometimes the depression and anxiety go unnoticed as it is subclinical but can impair individual's response to the treatment following maxillofacial trauma as it can cause poor compliance, drop outs during treatment and also poor comprehension to the treatment instructions. In addition, face deformity is of no concern for some individuals and they are not bothered for altered appearance.(5) This may be attributed to psychological refusal and non-acceptance of expending money in improving facial appearance or adequate care whenever needed.

During treatment of patients with maxillofacial trauma, it becomes important to address psychological issues other than the surgical treatment for improving patient's quality of life.

This study will address some psychological perspective of the maxillofacial trauma and to provide better care by including psychological rehabilitation following maxillofacial injuries.

HISTORICAL ASPECTS

The maxillofacial injuries had been described in early 17th century BC in Edwin Smith papyrus and mentioned was by Smith in 1862 in his publication and translated later by Breasted.(6) The treatment of maxillofacial injuries involve care of soft tissue as well as the fractures when present. The soft tissue injuries like contusions and abrasions are majority managed conservatively while lacerations and avulsion injuries needs repair as per the pattern of injury, by simple suturing or soft tissue cover using flaps. Fracture treatment of the face has been described and evolved from past. Hippocrates had described facial injuries around 400 BC and mentioned bandaging and methods of reduction of mandible fracture using hand and fixing it with gold or linen thread.(7)

Sushruta in 500 AD treated jaws by bandaging and bamboo stick mixed with flour and ghee.(8)

Barber surgeons were using classical treatment of fixing fracture by immobilizing with bandage and joined with ligature to maintain normal occlusion in 18th century.(9)

Thomas L Gilmer in 1887 brought the previous technique of intermaxillary fixation and used arch bars for mandible fractures.(10)

Mandible fractures were fixed using circumferential wire by Bauden to immobilize oblique fracture.(7) Drilling holes in fracture segment and suturing them using wire sutures was introduced by Buck.(10)

The first details of treating maxillary fractures were provided by Charles Fredrick Reiche in 19th century.(10) Carl Van Graefe reported use of head frame to treat maxillary fracture.(11)

In 1858, Hayward introduced metallic splints for severely dislocated fracture.(12) In 1866 Thomas Gunning designed a splint that was named after him as "Gunning Splint" with a single hole for eating and it was held with screw to hard palate and mandible.(13)

Rene Le Fort, a French surgeon after his study on cadaver's facial skeleton published in 1901 on the pattern of injury and classified midface fractures as Le Fort's fracture I, II and III.(14)

Robert H Ivy introduced technique of eyelet loop in wire ligature for intermaxillary fixation and was popularized as "as Ivy loop" .(10) Giles described in 1927 the technique of reduction of zygoma fracture .(15)

The methods of surgical treatment of maxillofacial injuries evolved with improvisation in anesthesia techniques and introduction of complex instrument for surgical treatment. In recent times, osteosynthesis is followed concept for facial fracture since 1970 using plates and screws. Michelet et al introduced miniplate osteosynthesis in 1973(16) and further developed by Champy and Lodde in 1975.(17) The plates and screws used are made of stainless steel, vitallium and titanium. Recently biodegradable poly-lactide plates and screws have been mentioned in use with good outcome. (18)

APPLIED ANATOMY OF MAXILLOFACIAL REGION

The face is an important part of the body of an individual for its identity and is the centre for expression of various emotions. Any deformities on face

Turnitin Originality Report

The psychological disorders following the maxillofacial trauma by 181213141. Mch Plastic Surgery Dr.Aashish Sasidharan

From TNMGRMU EXAMINATIONS (The Tamil Nadu Dr.M.G.R.Medical Uty 2014-15 Examinations)

Similarity Index	Similarity by Source	
7%	Internet Sources:	5%
	Publications:	5%
	Student Papers:	1%

sources:

Processed on 27-Mar-2015 23:16 IST
ID: 521055459
Word Count: 11065

1 2% match (Internet from 07-May-2014)
http://www.slideshare.net/indiandentalacademy/seminar-12mandibular-fractures

2 1% match (publications)
Ukpong, D.I.. "Psychological Complications of Maxillofacial Trauma: Preliminary Findings From a Nigerian University Teaching Hospital", Journal of Oral and Maxillofacial Surgery, 200705

3 1% match (Internet from 08-Oct-2010)
http://ccsenet.org/journal/index.php/gjhs/article/viewFile/3852/4543

4 1% match (publications)
Baek, Ji Eun, Chan Min Chung, and In Pyo Hong. "Reduction of Zygomatic Fractures Using the Carroll-Girard T-bar Screw", Archives of Plastic Surgery, 2012.

5 1% match (Internet from 11-Aug-2014)
http://newperspectivesinc.com/docs/pdf/Trauma%20Screening%20Questionnaire.pdf

6 < 1% match (publications)
Shekar, B. R. Chandra. "A five-year retrospective statistical analysis of maxillofacial injuries in patients admitted and treated at two hospitals of Mysore city", Indian Journal of Dental Research/09709290, 20081001

7 < 1% match (publications)
Quince, T. A., D. F. Wood, R. A. Parker, and J. Benson. "Prevalence and persistence of depression among undergraduate medical students: a longitudinal study at one UK medical school", BMJ Open, 2012.

Dr. B J Prashantha m, M.A, M. A., Dr. Min (ClinicaJ)
Director, Christian Counseling Centre,
Chairperson, Ethics Committee

Dr. Alfred Job Da niel, D Ortho MS Ortho DNB Ortho
Chairperson, Research Com mittee & Principal

Dr. Niha l Thomas
MD, MNAMS, DNB (Endo), FRACP (Endo), FRCP (Edin)
Secretary, Ethics Committee, IRB
Additional Vice Principal (Research)

September 26, 2013

Dr. Aashish Sasidharan
Senior PG Registrar
Department of Plastic and reconstructive Surgery
Christian Medical College
Vellore 632 004

Sub: Fluid Research grant project:
The psychological disorders following the maxillofacial trauma.
Dr. Aashish Sasidharan, Senior PG Registrar, Plastic and reconstructive Surgery, Dr. Ashish Kumar Gupta, Plastic and reconstructive Surgery.

Ref: IRB Min. No 8412 [OTHER] dated 13.08.2013

Dear Dr. Aashish Sasidharan,

The Institutional Review Board (Blue, Research and Ethics Committee) of the Christian Medical College, Vellore, reviewed and discussed your project titled "The psychological disorders following the maxillofacial trauma. " on August 13, 2013.

The Committee reviewed the following documents:

1. Format of IRB application form
2. Proforma
3. Hospital Anxiety and Depression scale
4. Tra uma Screening Questionnaire
5. General Health Question naire
6. CVs of Drs. Aashish Sasidharan and Ashish Kumar Gupta.
7. Consent form (English, Telugu & Tamil)
8. Patient Information sheet
9. No of documents 1-8

The following Institutional Review Board (Blue, Research & Ethics Committee) members were present at the meeting held on August 13, 2013 in the CREST/SACN Conference Room, Christian Medical College, Bagayam, Vellore 632002.

Or. B J Prashantham, M.A, M. A., Dr. Min (Clinical)
Director, Christian Counseling Centre,
Chairperson, Ethics Committee

Dr. Alfred Job Daniel, D Ortho MS Ortho DNB Ortho
Chairperson, Research Committee & Principal

Dr. Nihal Thomas
MD, MNAMS, DNB (Endo), FRACP (Endo), FRCP (Edin)
Secretary, Ethics Committee, TRB
Additional Vice Principal (Research)

Dr. Nihal Thomas	MD MNAMS DNB (Endo) FRACP(Endo) FRCP(Edin)	Secretary IRB (EC)& Dy. Chairperson (IRB), Professor of Endocrinology & Addi. Vice Principal (Research), CMC.	Interna l, Clinician

We approve the project to be conducted as presented.

The Institutional Ethics Committee expects to be informed about the progress of the project, any adverse events occurring in the course of the project, any amendments in the protocol and the patient information / informed consent On completion of the study you are expected to submit a copy of the final report. Respective forms can be downloaded from the following link: ht : 1 in the CMC Intranet and in the CMC website link address: http://www.cmch-vellore.edu/static/research/Index.html.

Fluid Grant Allocation:

A sum of 29,000/- INR (Rupees Twenty Nine Thousand only) will be granted for 1 year

Yours sincerely

Dr. Nihal Thomas
Secretary (Ethics Committee)
Institutional Review Board

Dr Nihal Thomas
MBBS MD MNAMS DNB (Endo) FRACP(Endo) FRCP(Edin)
Secretary (Ethics Committee)
Institutional Review Board

CC: Dr. Ashish Kumar Gupta, Plastic and reconstructive Surgery, CMC.

Ethics Committee Blue, Office of Research, Ist Floor, Carmen Block, Christian Medical College, Vellore, Tamil Nadu 632 002
Tel: 0416 - 2284294, 2284202 Fax: 0416 - 2262788, 2284481 E-mail: research@cmcvellore.ac.in

ACKNOWLEDGEMENT

*It is my proud privilege to express my heartfelt sense of gratitude and sincere obligation to my esteemed guide **Prof. ASHISH KUMAR GUPTA**, Professor and Head of Department of Plastic and Reconstructive Surgery for his masterly guidance, constant inspiration, worthy suggestions, heartening encouragement and affectionate advice which has enabled me to complete this work successfully*

*I sincerely thank all members of **IRB committee**, Christian Medical College, Vellore for approving my study.*

*I fall short of words in expressing my sincere thanks to my teachers, **Prof. Kingsly Paul M and Prof. Elvino Baretto** for all their support and encouragement throughout the work.*

*I am very much thankful to **Mrs. Tunny Sebastian**, Deaprtment of Biostatics in performing the statistical analysis in formatting the thesis.*

*I am very much thankful to my colleagues and dear friends **Dr.Amish JG and Dr. Geley Ete** for their ty help and cooperation and endurance which enabled to execute this work untiringly.*

I am indebted to my patients who coperated to carry out this work. I would express my profound and sincere gratefulness to all the Authors whose work helped me throughout this task.

*I wold like to express my profound and sincere love to my mother **Smt.Sujatha Sasidharan, my father Sri. R.Sasidharan, brother Ajith Sasidharan , wife Dr.Reshmi Raveendran and my daughter Anoukhi** for their constant inspiration with love and affection throughout my life.*

Before concluding, this is my heartily prayer to 'THE ALMIGHTY' for well being of those who helped me to complete this work.

DR.AASHISH SASIDHARAN.

TITLE: The psychological disorders following the maxillofacial trauma.

Keywords: *Maxillofacial trauma, psychological disorders, general health care-12 (GHQ-12), hospital anxiety and depression scale (HADS) ,trauma screening questionnaire (TSQ) and post-traumatic stress disorder (PTSD).*

AIM/ OBJECTIVES:

This study is to analyze the psychological consequences following the maxillofacial trauma. The study will help to determine the need of mental health services in maxillofacial trauma patients.

MATERIAL AND METHODS:

This prospective study included 86 maxillofacial trauma patients treated under Department of Plastic Surgery between 1st September 2013 to 31st August 2014, in age group above 18 years without any life threatening injuries. The sociodemographic and clinical details assessed and psychological disorders screened using standard available questionnaire, included general health questionnaire-12(GHQ-12), hospital anxiety and depression scale(HADS) and trauma screening questionnaire (TSQ). The analysis was done during baseline visit at 10th day, first follow-up after one month and second follow-up after 6 months.

RESULTS:

The psychological disorder assessed with GHQ-12 identified 86% patients with psychological problems, whereas 27.9% and 26.74% patients had scoring above clinical threshold on hospital anxiety and depression subscale. The patients detected with post-traumatic stress disorders in 23.6% patients. There was decrease in these psychological problems during second follow-up from baseline visit while post-traumatic stress disorder continued to persist. Among patients with motor vehicle accidents 29 patients noticed develop travel anxiety. The psychological disorders were more among maxillofacial fracture patients than patients with soft tissue injury patients.

CONCLUSION:

The study detected the psychological impact of maxillofacial trauma patients and hence determined the need to integrate a multidisciplinary approach to addresses the psychological care to avoid morbidity in consequence to it.

TABLE OF CONTENTS

INTRODUCTION

Trauma is a leading cause of disability, morbidity and mortality throughout the world. Road traffic injuries are leading cause of trauma and are increasing in India at an alarming annual rate of 3%.[1] Face being the prominent part of the body is reason susceptible to injuries. In addition, the face provides protection for the cranium and has an important role in its appearance. Face is the index of the mind; the individual's mental constitution is reflected on the face. However, trauma to face is an acquired cause of disfigurement; a scar can be blemish to an individual. Facial disfigurements are judged to be among the least desirable handicaps and can become a stigma.

Individual having change in facial appearance due to any cause can be difficult task and individual living with such facial trauma may be difficult to predict the course of adaptation that depends on variables like medical, social, personal and psychological factors.[2]

The maxillofacial region serves several functions like sight, smell, eating, breathing and talking. These functions may get impaired following trauma leading to poor quality of life. There are various reasons for maxillofacial trauma, the road traffic injuries accounts the most among them. The increase in road traffic injuries can be due to increasing economic pattern in society and more use of motor vehicles on the road and lack of proper implementation of traffic regulations.

Apart from road traffic injuries, assault, fall, sports and work related injuries are other common causes of maxillofacial injuries. The trauma can cause trivial injuries to mortality. However, the trauma can have severe impact on the individual's mind that can cause psychological problem like depression, anxiety, and post traumatic stress disorders. This response can remain for a year or more.[3]

Although following maxillofacial injuries depression and anxiety can lead to delay in recovery and prolong duration of treatment.[4]

Sometimes the depression and anxiety go unnoticed as it is subclinical but can impair individual's response to the treatment following maxillofacial trauma as it can cause poor compliance, drop outs during treatment and also poor comprehension to the treatment instructions. In addition, face deformity is of no concern for some individuals and they are not bothered for altered appearance. This may be attributed to psychological refusal and non-acceptance of expending money in improving facial appearance or adequate care whenever needed.[5] This may be attributed to psychological denial and lack of investment in facial appearance by the individual.

During treatment of patients with maxillofacial trauma, it becomes important to address psychological issues other than the surgical treatment for improving patient's quality of life.

This study will address some psychological perspective of the maxillofacial trauma and to provide better care by including psychological rehabilitation following maxillofacial injuries.

AIMS

&

OBJECTIVES

The impact of the maxillofacial trauma on patient is physical as well as psychological. This study is to analyze the varied psychological implications that the maxillofacial trauma victim can have following trauma. The study will help in determine the need of mental health services in maxillofacial trauma victims.

REVIEW OF LITERATURE

HISTORICAL ASPECTS

The maxillofacial injuries had been described in early 17th century BC in Edwin Smith papyrus and mentioned was by Smith in 1862 in his publication and translated later by Breasted.[6] The treatment of maxillofacial injuries involve care of soft tissue as well as the fractures when present. The soft tissue injuries like contusions and abrasions are majority managed conservatively while lacerations and avulsion injuries needs repair as per the pattern of injury, by simple suturing or soft tissue cover using flaps. Fracture treatment of the face has been described and evolved from past. Hippocrates had described facial injuries around 400 BC and mentioned bandaging and methods of reduction of mandible fracture using hand and fixing it with gold or linen thread.[7]

Sushruta in 500 AD treated jaws by bandaging and bamboo stick mixed with flour and glue.[8]

Barber surgeons were using classical treatment of fixing fracture by immobilizing with bandage and joined with ligature to maintain normal occlusion in 18th century.[9]

Thomas L.Gilmer in 1887 brought the previous technique of intermaxillary fixation and used arch bars for mandible fractures.[10]

Mandible fractures were fixed using circumferential wire by Bauden to immobilize oblique fracture.[7] Drilling holes in fracture segment and suturing them using wire sutures was introduced by Buck.[10]

The first details of treating maxillary fractures were provided by Charles Fredrick Reiche in 19th century.[10] Carl Van Graefe reported use of head frame to treat maxillary fracture.[11]

In 1858, Hayward introduced metallic splints for severely dislocated fracture.[12] In 1866 Thomus Gunning designed a splint that was named after him as "Gunning Splint" with a single hole for eating and it was held with screw to hard palate and mandible.[13]

Rene Le Fort, a French surgeon after his study on cadaver's facial skeleton published in 1901 on the pattern of injury and classified midface fractures as Le Fort's fracture I, II and III.[14]

Robert H.Ivy introduced technique of eyelet loop in wire ligature for intermaxillary fixation and was popularized as "as Ivy loop" .[10] Gilles described in 1927 the technique of reduction of zygoma fracture .[15]

The methods of surgical treatment of maxillofacial injuries evolved with improvisation in anesthesia techniques and introduction of complex instrument for surgical treatment. In recent times, osteosynthesis is followed concept for facial fracture since 1970 using plates and screws. Michelet et al. introduced miniplate osteosynthesis in 1973[16] and further developed by Champy and Lodde in 1975.[17] The plates and screws used are made of stainless steel, vitallium and titanium. Recently biodegradable poly-lactide plates and screws have been mentioned in use with good outcome.[18]

APPLIED ANATOMY OF MAXILLOFACIAL REGION

The face is an important part of the body of an individual for its identity and is the centre for expression of various emotions. Any deformities on face from birth or other causes like following trauma can cause disfigurement and damage such a scar that can lead to implications beyond the physical problem.

Structurally it has regions divided into forehead, midface and jaw. It possesses vital structures like eyes, nose, mouth, ear, teeth and various structures have its importance for various functions. Face also is the region to sense touch, smell, taste, sound hearing and visual stimuli.[19]

Each human have their own peculiar facial pattern which depends upon the soft tissue and bony structures comprising it. Facial appearance is important in determining the beauty of an individual.

The soft tissue consists of skin, fat, fascia, muscle, ligaments, nerve, blood vessels, and glands, while bony frame consists of maxilla, zygoma, nasal bone, mandible, palatine bone, inferior nasal concha, vomer, ethmoid bones and plates of sphenoid.[19]

The injury can damage soft tissues as well as fractures of underlying bones causing alteration in the appearance of face even after repair of these structures.

Frontal bone forms the upper part of the bony framework of the face and is portion of calvaria.[19]

Maxilla:

Maxilla is paired bone in the centre focus of midface fused together as a unit. Each half is pyramid shaped body with its maxillary antrum and four processes- frontal, alveolar, zygomatic and palatine process. The alveolar process of maxilla contains tooth on it .[20]

Zygoma:

The zygoma is a paired bone that brings prominence to the cheek.. This bone is with four processes, orbit's lateral wall is constituted by frontal, the temporal process articulates with process from temporal bone and forms zygomatic arch. The maxillary process forms infraorbital rim and part of floor. The fourth process joins with maxilla forming cheek prominence.[20]

Nose:

The nose framework consists of bone and cartilaginous structure. The paired nasal bone is supported on upper third with frontal and maxillary bones and inferiorly is supported by upper and lower lateral cartilage. The nasal bones are thick over upper part and thin in its lower part which is more prone for fractures.[20]

The ethmoid bone is single bone present in centre pat of the face and is part of nasal septum and gets attached to cribriform plate superiorly, sphenoid bone on its poster superior portion and vomer on poster inferior portion.[20]

Vomer is also a midline unpaired bone forming posterior portion of bony nasal septum articulating with palate, ethmoid and maxillary bone.[20]

The paired palatine bones join sphenoid with maxilla. It consists of vertical plate contributing to form part of orbital floor and horizontal plate joins in midline and forms hard palate. The sphenoid bone is a single midline bone at the base of skull and is posterior transition from facial bone to cranial bones.[20]

Mandible:

The mandible forms the bony framework of lower face and it consists of body and two rami with their junction forming an angle. The superior part of the ramus is formed by mandibular notch bounded anteriorly with coronoid process and posterior portion with neck and head of the mandible. The upper border of body consist alveolus with tooth that articulates with the maxillary tooth on its alveolar process. The mandible also provides attachment to the muscles of mastication (temporalis, masseter, medial pterygoid and lateral pterygoid) that helps in movement of mandible up, forward and medial directions. Others are anterior (depressors) group of muscles that includes geniohyoid, genioglossus, and mylohyoid and digastric muscles. These muscles influence the degree and displacement of the mandible fracture.[20]

CLINICAL FEATURES, CLASSIFICATION AND DIAGNOSIS

The pattern of injuries to maxillofacial region depends upon the mode of injury, and can cause very small injury like contusion to severe injuries like fractures of the bone that can cause sometimes airway compromise that can be life threatening. The diagnosis of these injuries is done on clinical assessment and bony fractures are further confirmed by radiological assessment.

Soft tissue injuries are classified as follows:

Contusion is seen following blunt trauma that results in edema and hematoma formation in the subcutaneous tissue. [21]

Abrasion develops following deflecting type of trauma, such as sliding along pavement. The epithelia layer gets removed and papillary layer of the dermis leaves the raw, bleeding reticular layer of the dermis exposed.[21]

Laceration occurs following crushing type of injury in which there is tearing away of soft tissues, but the wounds can be closed primarily .[21]

Avulsion also develops from tearing away of soft tissue injuries with loss of soft tissue which needs reconstruction.[21]

The soft tissue injuries can involve various important structures of face like eyes which can impair vision, can injure nerve like facial nerve and others depending upon region involved and can cause debilitating consequences.

The facial bone fractures can present with associated soft tissue injuries or isolated. They usual presents with pain, facial swelling and other clinical features depending upon underlying bone fracture.

Maxilla fractures:

Maxilla fractures are characterized by maxillary mobility with or without tooth loss. Periorbital edema and ecchymosis, nasal bleed, CSF leak otorhea/rhinorrhea unless proved otherwise. Visual symptoms like diplopia, step deformity, nasal crepitation, dish like face, malocclusion with anterior open bite. The radiographic evaluation is done once patient is stabilized, midface CT scan is the preferred modality.[22]

Rene Le Fort classified[14] three pattern of midface fracture as follows:

Le Fort's 1 fracture (Guerin's fracture) occurs at level of the piriform aperture and involves anterior and lateral walls of maxillary antrum, lateral nasal wall and pterygoid plates. The nasal cartilage may get buckled. The pull from pterygoid muscles displaces the fracture segment posteriorly and inferiorly leading to anterior open bite.

Le Fort's 2 (Pyramidal) fracture, involves nasofrontal suture, nasal and lacrimal bones, infraorbital rim in region of zygomaticomaxillary sutures, maxilla and pterygoid plates.

Le Fort's 3 (craniofacial disjunction) fractures, fracture line runs through the zygomatico-temporal and zygomatico-frontal sutures, along lateral orbital wall, infraorbital fissure and naso-frontal suture medially and ends at pterygomaxillary fissure.

In naso-orbit-ethmoid injuries the nasal bridge get depressed, splayed and epistaxis. Telecanthus will be present (intercanthal distance more than 40mm). Epiphora can occur due to injury to the lacrimal apparatus. CT scans with both coronal and axial views helps in diagnosis.

Markowitz and Manson[23] classified nasoorbitoethmoidal fracture based on attachment of media canthal ligament to the central segment as:

Type 1: Unilateral incomplete fracture, occasionally bilateral that is displacing inferiorly

Type 2: Comminuted central fragment, large bone fragment remains attached with the medial canthal ligament.

Palatal Fractures are classified by Hendrickson et al.[24] as:

Type1: Alveolar fracture

Type1a: Anterior alveolus; contains only incisor teeth and associated alveolus

Type1b: Poster lateral; contains premolars, molars and associated alveolus

Type II: Sagittal fracture, a split of the palatal midline

Type III: Parasagittal fracture

Type IV: Para-alveolar fracture; occurs palatal to the maxillary alveolus and incisors

Type V: Complex comminuted fracture; multiple fractured segments

Type VI: Transverse fracture, rare; involves a division in the coronal plane.

Zygoma fracture:

As zygoma is in proximity to the eyeball always ophthalmological assessment is required. Certain clinical features of zygoma fractures are Periorbital edema and ecchymosis, impaired sensation over infraorbital nerve distribution, subconjuctival hemorrhage, flattening of malar prominence and zygomatic arch, step deformity along orbital rim and trismus. The difficulty in opening mouth can be due to muscle spasm secondary to

impingement of displaced fragments in zygomatic arch fracture on temporal muscle. Vision problems like diplopia and enophthalmos.The plain x-rays with Water's view, Caldwell view and Submento-vertical view detects the fractures but the displacements, comminuted fractures and fracture patterns are best revealed with computed tomography.

Based on the direction of anatomic displacement and pattern formed by fracture Knight and North[25]) proposed the classification:

Group 1: No significant displacement, fracture visible on radiography but fragments remain in line,

Group 2: Arch fracture, which involve inward buckling of the arch with no orbital or anterior involvement,

Group 3: Not rotated body fracture; downward and inward displacement but inward displacement but no rotation

Group 4: Medially rotated body fracture; downward, backward and backward displacement with medial rotation

Group 5: Laterally rotated body fracture; downward, backward and medial displacement with lateral rotation of zygoma

Group 6: All cases in which addition fracture line cross the main fragment

In 1990, Manson and Markowitz[26] proposed their classification of midface fracture based on the amount of energy dissipated by facial bones. They classified onto high, moderate and low energy fracture based on CT scan. High energy fracture has extreme displacement, comminution and segmentation of bone on the other hand low energy is characterized by displacement but without comminution of bone.

Mandible fractures:

Malocclusion, anterior open bite may result from bilateral fractures of the mandible condyle or angle. Unilateral pen bite may occur because of ipsilateral angle and parasymphyseal fractures. A posterior open bite occurs with fractures of the anterior alveolar process or parasymphyseal fracture. A posterior cross bite can result from midline symphyseal and condylar fractures, with splaying of posterior mandibular segments. Mandible mobility will be present and can be sensory loss over lower lip and chin if mantle nerve gets injured.

The radiological evaluation detects the fracture; panoramic radiography is the most useful radiography as it reveals whole of the mandible including the condyles. Although CT scans gives better view in cases of condylar fractures.

Mandible fractures have been classified in various ways some of them are mentioned here.

A) Dingmans and Natvig[27] classification based on anatomic region involved:

1) Midline: In between central incisors fracture occurs

2) Parasymphyseal: Within the area of symphysis the fracture line occurs

3) Symphysis: The region within boundary of vertical lines distal to the canine teeth on either side

4) Body: Region extending from the distal symphysis to a line coinciding with the alveolar border of the masseter muscle (usually including the third molar)

5) Angle: Region triangle in shape bounded by the anterior border of the masseter muscles to the poster superior attachment of the masseter muscle (usually distal to the third molar)

6) Ramus: Area bounded by the superior aspect of the angle to two lines forming an apex at the sigmoid notch

7) Condylar process: Portion of the condylar process superior to the ramus

8) Coronoid process: Incorporates portion of the mandible superior to the ramus region anteriorly

9) Alveolar process: The superior margin that would normally contain teeth

B) Kazanjian and Converse[28] have classified based on presence or absence of serviceable teeth in relation to the line of fracture:

1) Class I: Teeth are present on both side of the fracture line

2) Class II: Teeth are present on only one side of the fracture line

3) Class III the patient is edentulous

C) Rowe and Killey[29] have divided mandibular fractures into two classes:

1) Not involving basal bone

2) Involving the basal bone

D) Kruger[30] classified into simple, compound and comminuted.

E) Kruger and Schili[31] classified as follows:

1. Relation to the external environment

a. Simple or closed

b. Compound or open

2. Types of fractures

   a. Incomplete

   b. Greenstick

   c. Complete

   d. Comminuted

3. Dentition of the jaw with reference to the use of splints

   a. Sufficient dentulous jaw

   b. Edentulous or insufficiently dentulous jaw

   c. Primary and mixed dentition

4. Localization

   a. Fractures of the symphysis region between the canines

   b. Fractures of the canine region

c. Fractures of the body of the mandible between the canine and angle of the mandible

d. Fractures of the angle of the mandible in the third molar region

e. Fractures of the mandible ramus between the angle of the mandible and sigmoid notch

f. Fractures of the coronoid process

g. Fractures of the condylar process

5. Shetty et al.[32] combined six significant injury criteria to create the acronym FLOSID:

i) Fracture type (F)

a. Incomplete

b. Simple

c. Comminuted

d. Bone defect

ii) Location of fracture (L)

a. Left from midline (L1) to condylar head (L8)

b. Right from midline (R1) to condylar head (R8)

iii) Nature of occlusion (O)

a. Normal

b. Malocclusion

c. Edentulous

iv)Extent of soft tissue damage(S)

a. Closed

b. Open intraorally

c. Open extraorally

d. Open intraorally and extraorally

e. Soft tissue defect

v) Presence of infection (I)

a. Yes b. No

vi) Radiographic analysis of inter-fragmentary displacement (D)

a. Mild b. Moderate c. Severe

6. Angle[33] classified as favorable and unfavorable depending upon the muscles acting causing the fractured bones to impact with minimal displacement in favorable type and causing gross displacement in unfavorable type.

7. Condylar fractures[33] are generally classified as

i) Extra capsular

ii) Sub condylar

iii) Intracapsular

8. Condylar fracture classified by Loukota et al.[34] mentioned a reference line, which is a linear line extending from the posterior border of the condyle neck through the sigmoid notch to the tangent of the ramus.

i) Diacapitular type: Fracture through the head of condyle in the articular surface

ii) Fracture of condylar neck: with minimum 50% fracture line above reference line

iii) Fracture of condylar base: with minimum 50% below reference line.

REVIEW ON PSYCHOLOGICAL ASPECTS OF MAXILLOFACIAL TRAUMA

Among the leading causes of mortality worldwide, trauma accounts 11% and can cause physical morbidity and psychological disability.[35] Although maxillofacial trauma usually cause non-lethal injuries but it can cause a major psychological burden. Anxiety, depression and post-traumatic stress disorder are common psychological problems found post trauma but remains unnoticed without any treatment for these conditions. [36, 37]Despite being an important factor for traumatized patient to have psychological care, there lacks policy for assessing mental status in trauma patients in Indian hospitals.

In literature, post-traumatic stress disorder (PTSD) was most investigated psychological problem following any traumatic event.[38] PTSD defined with symptoms of threat of danger, nervousness, defenseless and repeated memories of previous incidents following physical and psychological trauma persisting more than 30 days of traumatic incident. [33] The studies found that patients post injury having PTSD with the incidence ranging from 30 and 93%.[39–41] Post-traumatic stress disorder had been found associated with depression[41,42] and has been reported after 6 months of the injury regardless of injury type.[43]

Depression also found to be a psychological squeal following trauma and is studied less and usually it occurs along with other psychological disorders.(44) Mayou and

Bryant(45) reported 26% mental health problem, including depression in a study of traumatic injury following motor vehicle accidents in five hundred seven patients.

In a comparative cohort study, reported a two times anxiety symptoms and 9 times depressive problems in fifty patients needing facial surgery following traumatic facial injury when compared with non-traumatic cause. [46]

Bryant et al.in their study with 817 patients with various injuries and 31% had psychological problems PTSD, anxiety and depression following trauma.[47]

Various studies outcome emphasized the requirement of routine intervening measures for treatment of symptoms indicating psychological problems following trauma to decrease long term negative effects on individual's overall health.[48–50] The maxillofacial trauma accounts a major part of traumatic injury especially following motor vehicle accidents.

In literature various causes of maxillofacial trauma has been described, most them being traffic related injuries from motor vehicle accidents, assaults, falls, sport, work related etc. In various studies the motor vehicle accidents is the most common cause for maxillofacial injuries, followed by falls, assault, sports related and work related injuries.[51]

In other study, done on maxillofacial fracture in Southern Bulgaria[52] found most injuries caused by violent assault(61%), followed by motor vehicle accidents(15.5%), fall (12.5%) and animal bites accounting(4%).

Increase in assault causing trauma had been reported due to association between alcohol and interpersonal violence and various studies had correlated maxillofacial trauma with alcohol consumption.

Mayou et al. studied the effects of road traffic accidents as driving behavior and noted 20% motorcyclist during and 50% drive with more precaution. Study also found lack of confidence among the drivers.[53]

In a study on long term outcome of motor vehicle accidents injury by Mayou et al. described 25% motor vehicle accident victims suffered phobic anxiety while travelling as driver or a passenger. The study also reported prevalence of post-traumatic stress disorder being approximately 10%.[54]

In literature, there is huge diversity in the use of the helmet as safety measure by two wheeler drivers worldwide. . In a study in India, 23.3% motorcyclist reported not wearing a helmet whereas 72.15 were not wearing it regularly [55] and risky behavior while driving by young riders and males.

Jayadevan et al. noted uses of helmet in 26.9% of motorcyclist, 42.1% were habitual alcohol users and 11.7% participants were ignorant about use of helmet as safety measures while driving. Many respondents believed that enforcing strict laws for using helmets only will promote its regular use by motorcyclists.(56)

Facial disfigurement is one of the important physical consequences of maxillofacial trauma. Maxillofacial trauma victims often experiences anguish and resentment, and consequently may be emotionally disabled.(57)

Oral and maxillofacial surgery has made great strides in the care of patients with facial injury.. Recent improvement in anaesthesia and reconstructive surgeries has greatly facilitated the physical rehabilitation of individuals with such injuries. Whereas, the psychological morbidity had been given least importance. The facial disfigurement following immediate trauma may be so gruesome tht it can cause long term emotional disturbances (58)

Studies had reports of anxiety, depression, and phobic anxiety among the injury group increasing during initial 6-month assessments, and after that decrease in 12-month assessment. Despite the decline in symptomatology over time, patients in the injury group has been reported with psychological problems.(59)

Mayou et al, documented high levels of distress in a heterogeneous group of patients after road traffic accident injuries and continuing psychiatric complications up to 1 year post-trauma(60) and also there are reports with patients showing anxiety about travel both as driver and passenger even after 5 to 6 years.[61]

Post-traumatic stress disorders were reported 27% and 41% by Bisson et al.(3) and Hull et al[62]) respectively..

Shofiq et al.[46] studied 50 patients with maxillofacial injury and compared with control and found to have 20% patients having anxiety and depression following trauma most of them being female and with facial scar. He also found significant correlation between patient's self-perception of facial disfigurement with anxiety and depression

Stephen M. Auerbach et al.[63] reported high levels of acute stress disorder during the short term follow up period after surgical treatment of maxillofacial injuries and suggested psychological symptoms develops even with minor face injury and the severity of injury and psychological distress have no significance

Lenton et al.[59] in a prospective study done in Los Angeles described the increased rates of anxiety, phobic anxiety, depression and hostility among the psychological distress detected in post trauma between 10 days to six months assessment and it decreased on 12th month assessment. Psychological problems were detected in 34%

subjects. The majority of the facial injuries were from interpersonal violence. The study reported the injured patients continue experiencing psychological distress up to one year.

The road traffic accidents had been reported as major cause for trauma in urban countries. In India there is an increase in road traffic accidents and it can be accounted to the increase in economic pattern of the country's population which had made the individuals to purchase the vehicles and its frequent use for travelling. But although there had been in increase in motor vehicles in the road the traffic regulations and safety measures are not strictly enforced as well as poorly structured road and common use of the roadways by pedestrians, strollers and domestic animals had made more prone for accidents and hence increase in injuries.

In an epidemiological study[64] on pattern of maxillofacial injuries in India done on 149 patients reported male (89.9%) mostly injured. The second to third decade age group was common. Road traffic accidents was the major cause for maxillofacial trauma followed by assault, animal bites mainly bear maul injury and work related injuries.

Isolated lower third face was most commonly fractured, commonest site being parasymphysis while coronoid being the least. In isolated upper third facial fractures dentoalveolar injury was most common followed by zygoma bone fracture. The alcohol was main intoxicating agent associated with these injuries.

Amiya et al. studied maxillofacial fracture patterns in North India urban population[65] and reported 82% male and 25% female among the participants involved and mainly were in the age group 15-29 years. Road traffic accidents was most common etiology of maxillofacial fracture accounting 51% followed by fall, interpersonal violence, firearm injury and other causes like sports related injuries, iatrogenic, animal attack and pathological fractures. Zygomatic complex fractures was most common region involved followed by Le Fort's 2 fracture in middle third face fractures. Parasymphysis was most commonly fractured bone in lower third face while parasymphysis being the least fractured in this study.

In a single centre retrospective study of the pattern of maxillofacial fracture in Central India described isolated mandible fracture is most common facial bone fractured and parasymphysis being the most common location to get fractured on the mandible. On midface zygoma fractured commonly followed by Le Fort's fracture. As in other studies, male were inured the most and alcohol consumption was also associated to be causative factor for maxillofacial trauma.[66]

The data published by J.Dula in Kosova (1983) suggested the etiology were falls at 42.9%, assaults at 19.81% animals at 10.74% and traffic related accidents at 9.12%. But during period 2001-2005 showed traffic related accidents at 43.1% and injuries from animals being 1.4%. The injuries from assaults had been on rise during this time.[67]

The study done in Norway, Germany and UK was compared with research done in Finland on change in pattern of etiology for maxillofacial trauma and found to have increase in injuries from assault and sports related. There was comparatively less number of cases from road traffic accidents.[68] The study also assessed the psychological problems on follow up and reported to have decrease in anxiety and depression but continued to have emotional distress.

In a survey conducted by British association of oral and maxillofacial surgeons on facial injuries in Britain revealed increasing number of assault as the major etiology of facial injuries and most of them were associated with history of alcohol consumption at the time of injury. The injury causing disfigurement to the face reminded them about the incident for long time and limiting their potential to achieve social and professional goals, preventing them to fulfill the emotional and economic needs.[69]

In UAE, assault related injuries were also more (57.6%) followed by falls (9.7%) and road traffic accident 13.7%.[70]

The injuries following assault are trivial as compared to injuries from impact of high speed as in motor vehicle accidents, fall from height or sports related. The victims also were found avoiding for availing medical care due to fear and embarrassment and

described using seat belts and airbag deployment in four wheelers decreases maxillofacial injuries.[71]

The alcohol consumption and its effect attributes to the cause for increase in facial injuries especially in young adults.[72]

Simpson and Mayhem[73] studied on youth and traffic accidents causes and preventive measures. The study concluded with findings suggesting that alcohol consumption was not infrequent in young drivers (16-19 years). Adequate strict legislation should be enforced to regulate the use of motor vehicles by the young drivers and measures to be taken for awareness among them about traffic rules.

Mayou, Bryant and Dutherie[74] did study to determine the mental health problems following road traffic accidents. In this study, 188 victims participated were in age group 18-70 years. Psychological outcome was determined by analyzing whether patient had developed post-traumatic stress disorder and travel anxiety. Data revealed male, single, unemployed motorcyclist being most common to get injured and many had positive

history of alcohol consumption. The study also reported 41% victims with emotional distress on initial assessment and had anxiety and depression above thresholds for clinical disorders. Acute distress was noted in 18% victims and was irrespective of age, sex and nature of the accident. The psychological outcome after 1 year was found poor. Few suffered mood disorders (anxiety and depression), few had travel anxiety as driver or as passenger and others developed post-traumatic stress disorder. The study also assessed

the psychological problems during follow up and reported to have decrease in anxiety and depression but continued to have emotional distress.

Few of the victims having memories of accident developed post-traumatic stress disorder with symptoms of avoidance, emotional arousal and intrusive thoughts. The study also described the change in travel behavior by the victims. The victims showed more concern while travelling themselves with adequate precautions and using safer way for travelling. The victims also expressed concern while there relatives were travelling and in severe cases did avoided using public transport. This change in pattern affected the day to day activities and also limited travelling and avoided the circumstances reminding the memories of the accident. The study emphasized importance for having psychological evaluation during each follow up.

The psychological consequences following maxillofacial trauma was assessed at two time interval by Hull et al.[62] The initial analysis was done within 10 days following

trauma and further assessment was done 4 to 6 weeks after trauma. General health questionnaire-28 was used to measure general mental distress with social symptoms, anxiety and insomnia, social dysfunction, depressive symptoms being its subscales. Hospital anxiety and depression scale (HADS) with anxiety and depression subscales was assessed with each having 7 questions with 0 to 21 scoring and the score more than 7 indicated disorder.

Revise impact of event scale (IES-R) and Davidson trauma scale (DTS) was used to assess post-traumatic stress disorder. Quality of life was scaled using EQ-5D and it had variables like self-care, mobility pain and discomfort, anxiety and depression levels and ability to carry out usual activities. In this study, initial assessment had 39 patients and on follow up had 24 patients. The 41% patients had symptoms suggestive of post-traumatic stress disorders and high psychological distress. Many patients showed scores more than 7 in HADS-anxiety subscale.

The study also discussed that certain parameters to be include during initial assessment like whether any psychological issues was there before trauma and any loss of normal functions to be assessed during each follow up. The study also discussed the response of treatment to physical injury depends on the psychological problems post injury.

Ukpong et al.[75] in his prospective study on psychological complications of maxillofacial trauma in Nigeria assessed subjects 10 days following injury, 6 to 8 weeks and 10 to 12 weeks on follow up. The tools used to measure psychological problems were GHQ-30 for psychological distress, HADS for anxiety and depression scale, trauma screening questionnaire (TSQ) for post-traumatic stress disorder. The clinical and socio demographic details were also collected for the study. The study concluded having psychological distress in 90% subjects at baseline and it remained similar in further two follow ups. At baseline HADS depression subscale was above threshold in 41.2% and in first follow up it was 47.1% and decreased in second follow up. The HADS- anxiety

showed 11.8% at baseline. Post-traumatic stress disorder was diagnosed in 3% and 17% in last two follow up. Motorcycle accidents causing facial injuries was 70.6% and males got commonly injured.

Acute stress disorder following facial injuries was detected in 25% by Shirley Glynn et al.(76) The problems which become chronic post-traumatic stress disorder were associated with previous history psychiatric illnesses and associated with severe pain at discharge. Psychological problems following maxillofacial injuries should be identified early to avoid long term psychological problems to lead a better quality of life.

In few researches done in USA(76) described the importance of psychological and social patterns and response following injury to the subject and its role in physiological

rehabilitation of the individual during treatment and subsequently during follow up. These studies collected data concerning demography and various social and psychological issues post facial injury immediately and during follow up. This study although did not included the long term follow up. Males were predominantly injured (78.7% to 89.9%) mostly in 20-30 years age group. The unemployment rates described were 60 to 67.4%. The study discussed the patients had no financial and social aid while approaching the definitive care after trauma. Alcohol use was direct or indirect etiology for maxillofacial injuries (). In various samples of the research described history of prior trauma (42.5%) especially following assault being reported to have further injuries and developed post-traumatic stress disorder being high (14.5%) in these subjects. The findings in this study were suggestive that these patients with orofacial injuries approached social and mental health

services. The data indicated 78.3% needed social service and 53% needed mental health service for lifetime. The need for current service was also analyzed and noted 48.6% and 36.9% for social and mental health services.

The interest of subjects for availing care for anxiety, depression and post-traumatic stress disorder and alcohol problems was asked. The subjects were moderately interested for follow up care for these problems. Also reported the subjects had few obstacles for approaching aftercare. The study discussed these being lack of suitable program, exceeding cost and transportation problems. The need for programs to reduce violent behavior was also emphasized.

However in other sample of sample of same research had most commonly injured subjects being women (25.2%) 18 to 29 years (38.8%) age group. Less than 20% of the injured subjects were married and more than 60% were unemployed. The social network and social support were less reported among the injured patients.

The study also highlighted the need of brief screening of the individuals following orofacial injury for mental health problems and substance abuse while approaching for the health care. The studies enforced the idea of rehabilitating the individual psychologically as well as socially as majority of these individuals were socio economically deprived and highlighted to include social programs for awareness related to alcSohol problems.

In Nigeria a study among 126 patients with soft tissue injuries over maxillofacial region were evaluated. The study reported males (67.5%) getting injured more frequently than females (32.5%), the subjects were in age group 10 months to 90 years. The road traffic accidents (54.9%) was most common etiology, motorcyclist (22.2%) being majority among them followed by assaults (17.6%). In this study, subjects had lacerations (56.5%), contusion (12.9%) and avulsion (8.8%) as soft tissue injuries, 15% of soft injuries were associated with head injury.[77]

In 30% patients with maxillofacial trauma had anxiety and depression reported by Sen et al.[78] using HADS as screening instrument. Spielberg described STAI (state anxiety inventory) as a reliable screening instrument for assessing anxiety.[79]

Several studies had used general health questionnaire (GHQ) as the assessment tool for psychological disorder and was found reliable and valid[80] even on its application in long duration studies. The GHQ was originally developed as 60 item instrument and later it was shortened in GHQ-30, GHQ-28, and GHQ-12 formats. The GHQ-12 format was as effective as the other formats.[81]

MATERIALS

&

METHODS

All the maxillofacial trauma patients treated under Department of Plastic and Reconstructive Surgery, during period 1st September 2013 to 31st August 2014 in age group more than 18 years.

Inclusion Criteria: The maxillofacial trauma patients above 18 years without any other life threatening injuries (like, Brain injury, /Orthopedics injury/Chest injury/Abdominal injury/Vascular Injury etc.)

Exclusion criteria: The maxillofacial trauma patients with any other life threatening injuries (like, Brain injury, /Orthopedics injury/Chest injury/Abdominal injury/Vascular Injury etc.)

The patients with maxillofacial injuries will be assessed after appropriate treatment on follow-up (10 days, one month and 6 months) after the trauma, by using standard instruments: Sociodemographic and clinical data, screening tools for psychological disorders like general health questionnaire-12(GHQ-12), hospital anxiety and depression scale (HADS) and trauma screening questionnaire (TSQ).

Sociodemographic and Clinical Data (Annexure-3):

The data will be obtained using a proforma and will be documented, including age, gender, educational attainment, employment status, occupation, marital status, mode of injury and pattern of injury. The clinical information obtained included cause of injury, site and type of injury, and whether

Treatment is operative or conservative. Information of alcohol consumption, history of any previous psychological disorders and whether anxiety of travelling present following trauma will also is documented.

General Health Questionnaire-12 (Annexure-4):

The General Health Questionnaire (GHQ-12) is a self-reporting screening instrument for psychological morbidity. The psychological health of the respondents will be measured using the 12-item General Health Questionnaire (GHQ-12) .The GHQ is a screening tool which was used to identify the severity of psychological distress experienced by an individual within the past few weeks. This scale focuses on breaks in normal functioning rather than on life-long traits; therefore, it only covers disorders or patterns of adjustment disorders associated with distress. Each item on the scale has four responses from “better than usual” to “much less than usual.” For the purpose of this study, the GHQ scoring method (0-0-1-1) was chosen the scores

were summed up by adding all the items on the scale ranging from 0 to 12. A score above a threshold of 4 Indicates psychological disorder. Both score of or above and total score were used for the analyses. [91]

Hospital Anxiety and Depression Scale (Annexure-5):

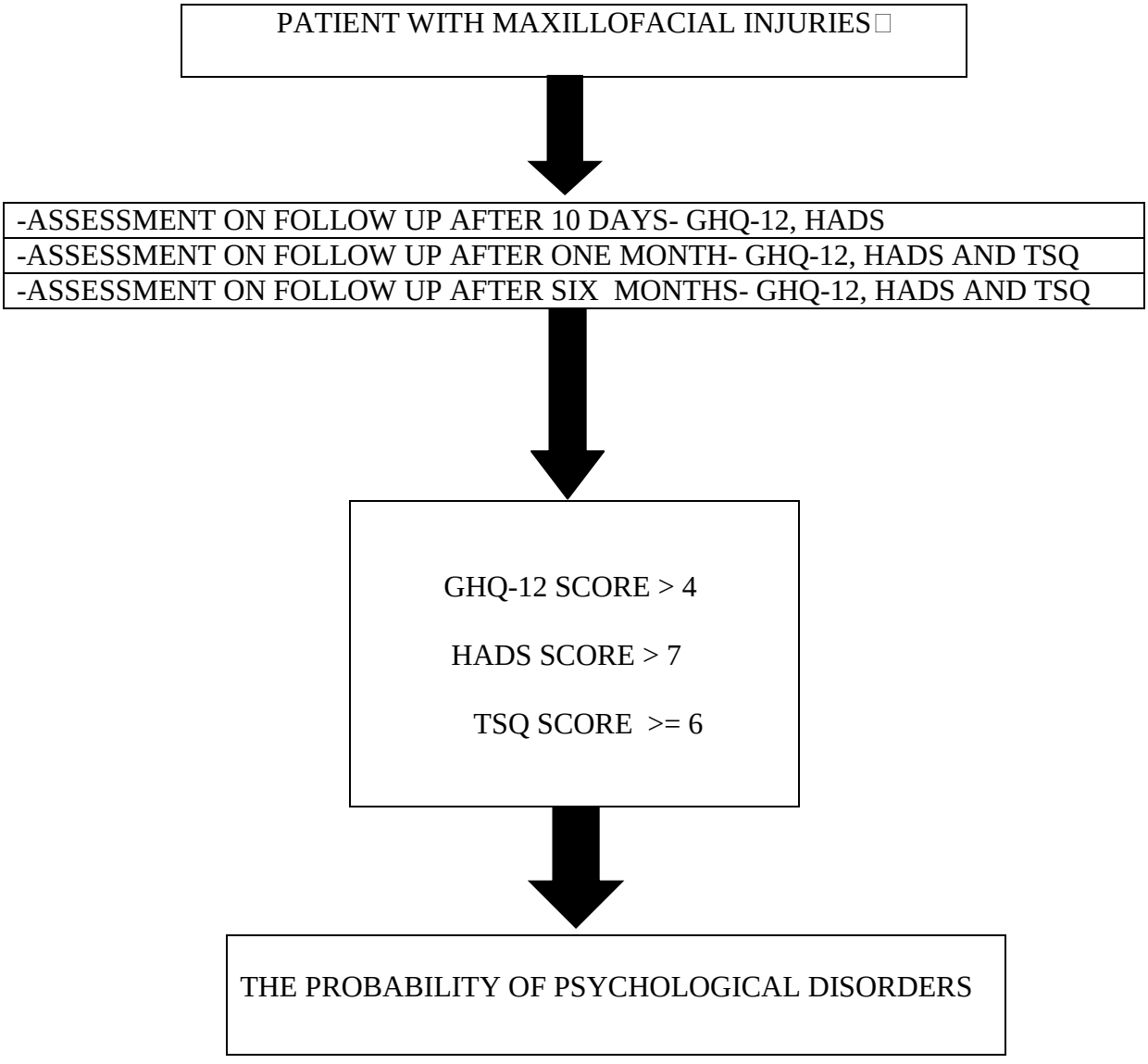
The Hospital Anxiety and Depression Scale (HADS) is a 14-item self-report instrument with anxiety and depression subscales. Each item is rated on a 4-point scale (0-3); with each subscale having a range of 0 to 21.The recommended score above a threshold 7 indicates of disorder. [92]

Trauma Screening Questionnaire (TSQ) (Annexure-6):

The trauma screening questionnaire[93] is a symptom-based screening instrument for posttraumatic stress disorder (PTSD). The scale has 10 items and each item is derived from the DSM-IV[94] criteria and describes either a re-experiencing symptom of posttraumatic stress disorder (PTSD) items 1 through 5 or arousal symptoms of PTSD (items 6 through 10). Avoidance and numbing symptoms, though

also listed in the DSM-IV criteria, were not included in the TSQ in keeping a screening instrument short and contain the minimum number of items necessary for accurate case identification.[95] A score of 6 or more is diagnostic of post-traumatic stress disorders.

ALGORITHM OF THE STUDY

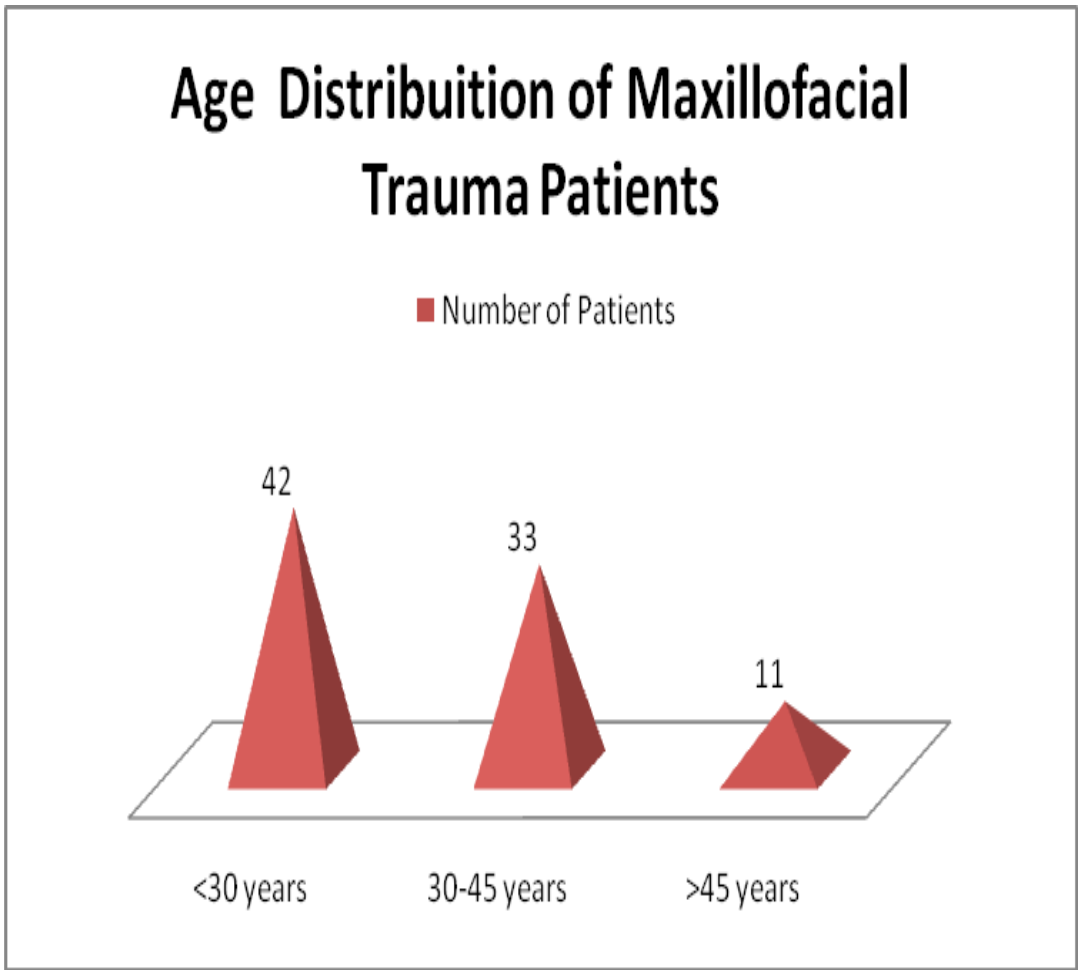


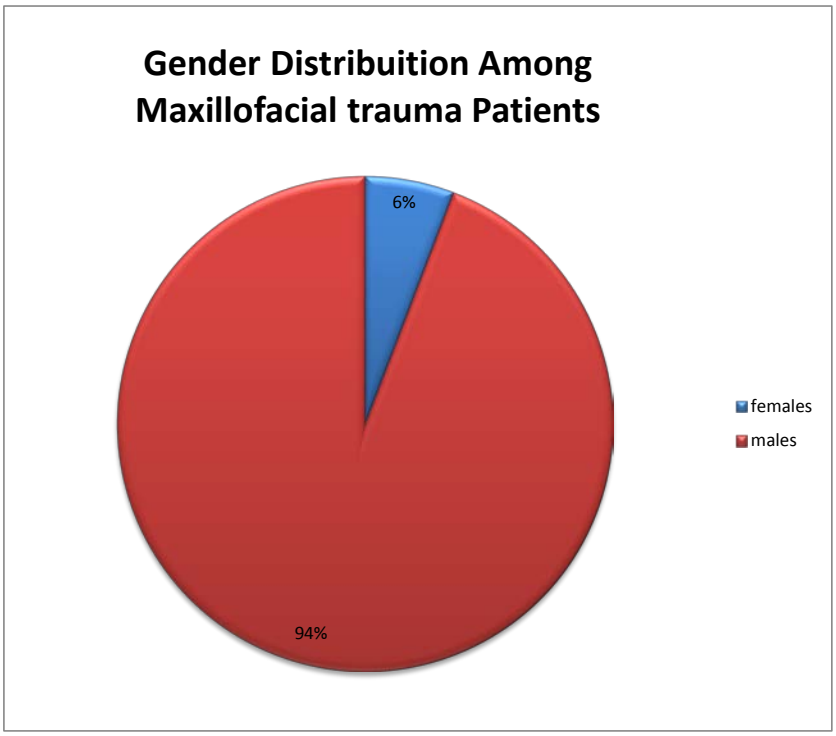
STATISTICS ANALYSIS

Frequencies and percentages were used to describe for demographic data. Categorical values were compared using Chi-Square test. The statistical analysis was done from the data collected using SPSS v.16.

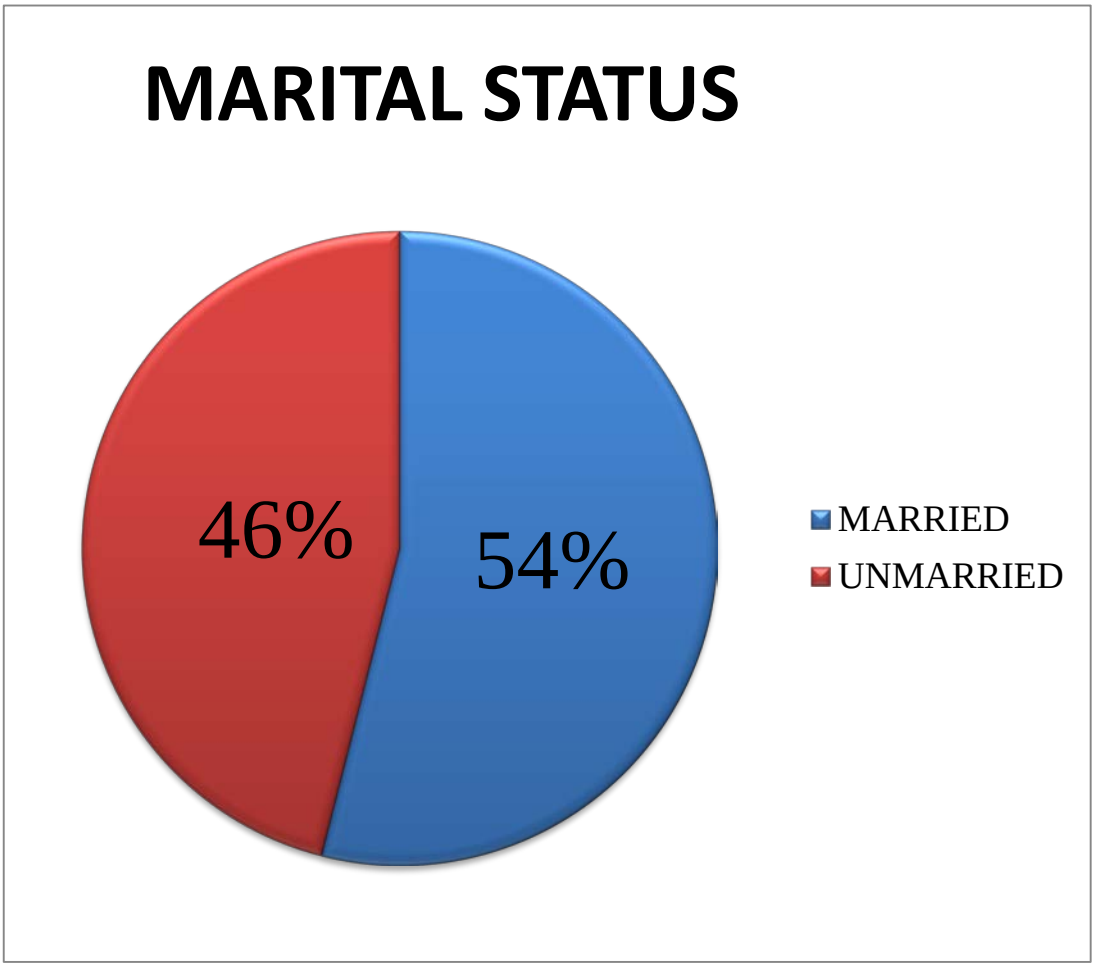
OBSERVATIONS

The study was done among 86 patients with maxillofacial trauma . The patients with age 30 years were 42(48.8%), 30-45 years age patients were 33(38.4%) and more than 45 years patients were 11(12.8%). The majority patients were young individuals with age<30 years.



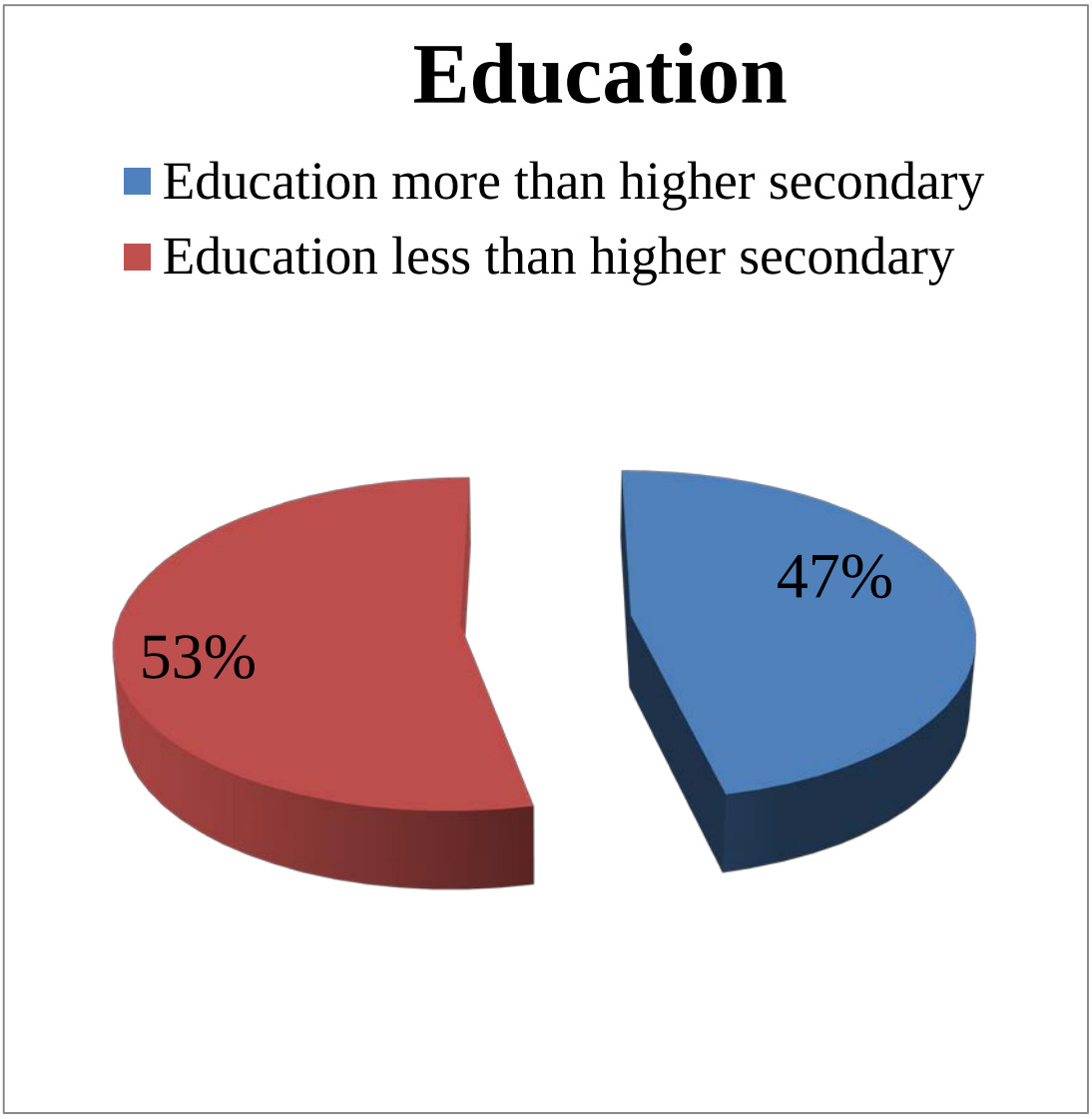


Males with maxillofacial trauma were 81(94%), whereas the female patients were only 5(6%), n=86. In our study, the age did not have significant association with psychological disorder following maxillofacial trauma.

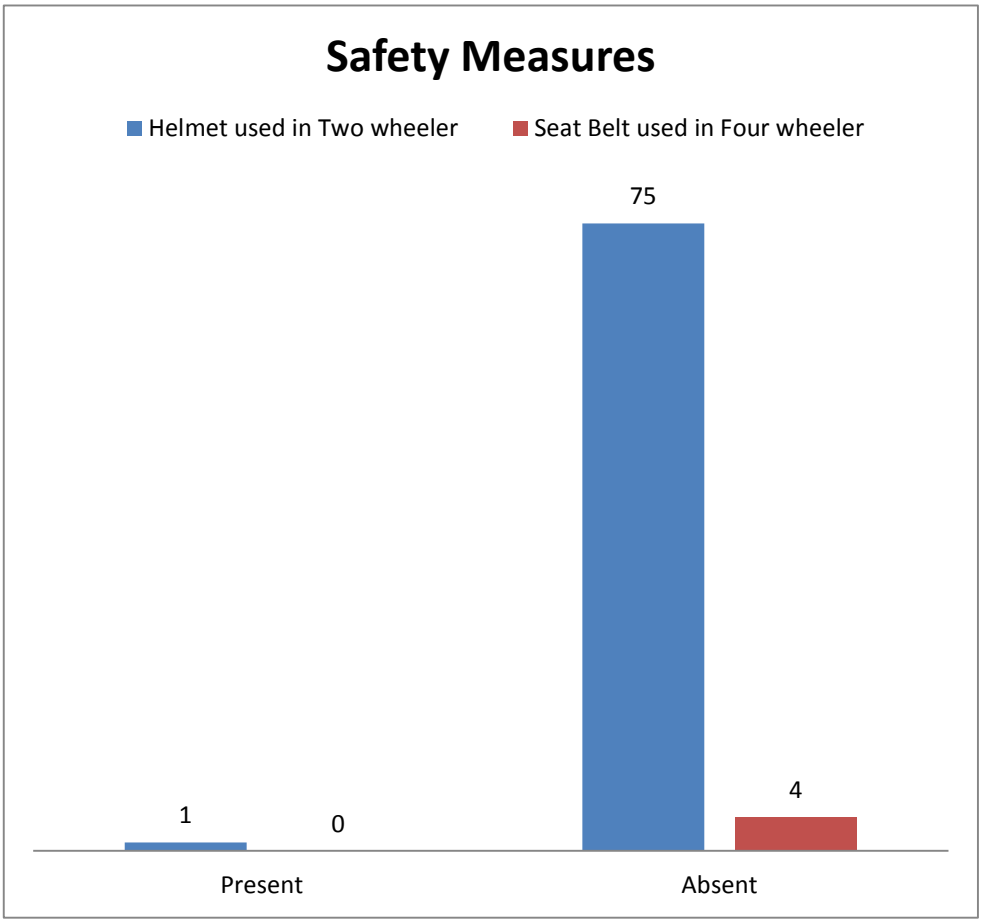


In our study, 46 patients (54%) with maxillofacial trauma were married whereas 40 patients were unmarried (46%). The marital status was found to have significant association (P<0.05) with psychological disorders in maxillofacial trauma patient.

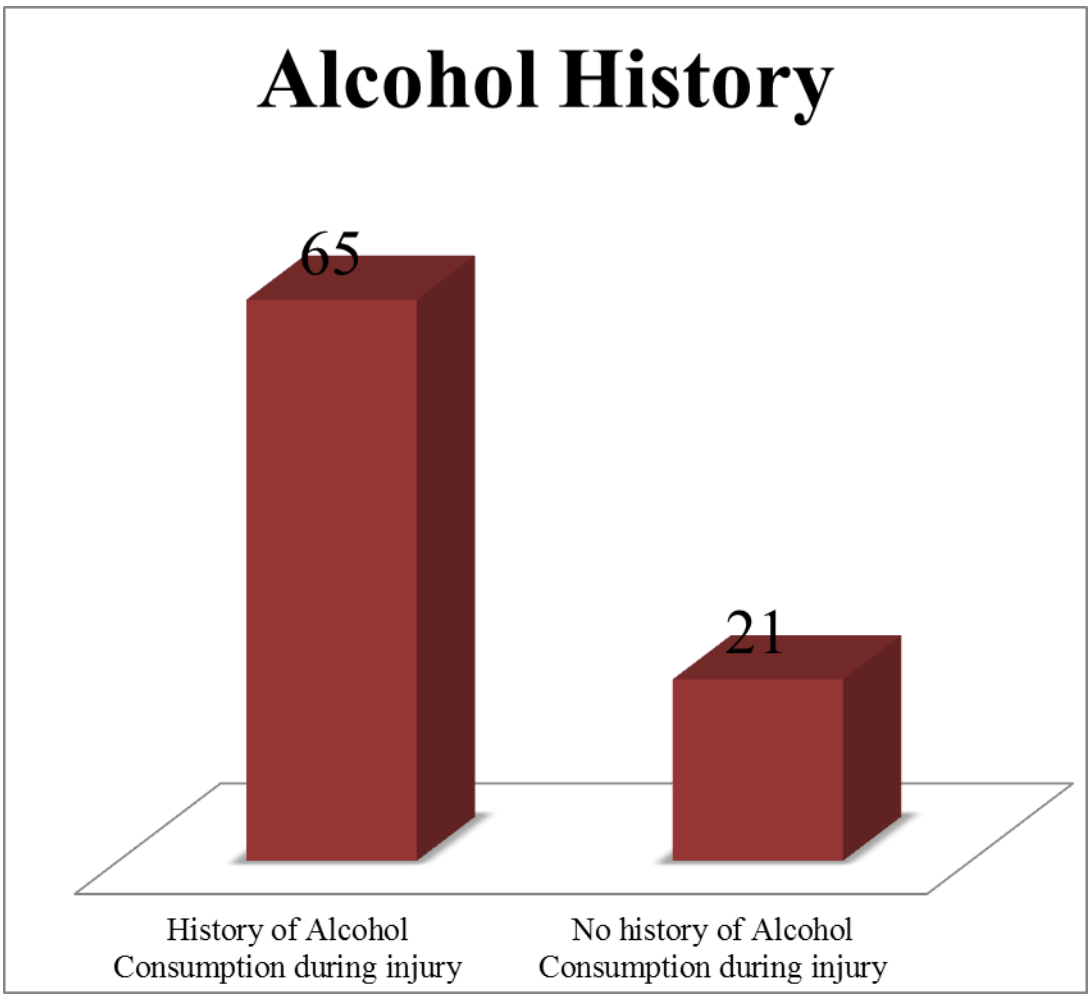
In our study, the individuals with maxillofacial trauma 38(44%) were unemployed while 48(56%) were employed in various jobs. There was no significant association found between the occupation and psychological disorders developing in maxillofacial trauma.



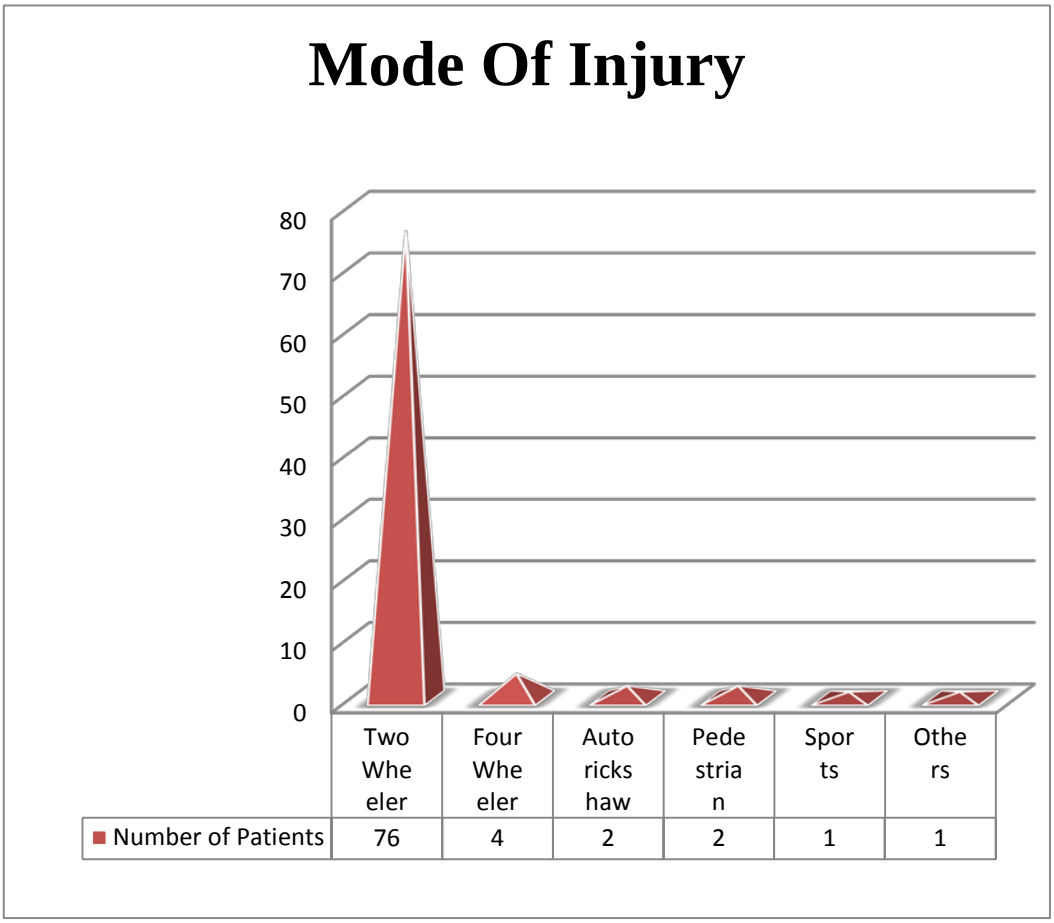
The level of education among the maxillofacial trauma facial were analyzed and found 40 patients with education more than higher secondary level whereas 46 patients were Hve education less than higher secondary level, however there was no significance found with respect to psychological disorders in our study.



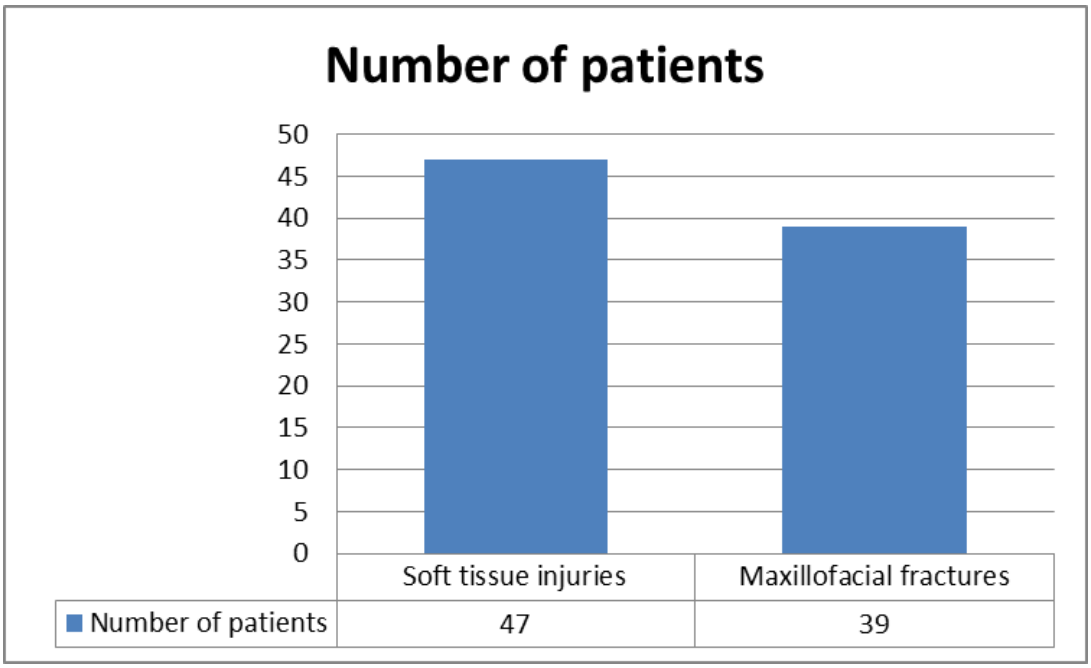
The safety measures analyzed in our study was helmet in two wheelers and seat belt in four wheelers. It was found that 76 patients were driving motorcycles at time of injury and 75 among them were not wearing helmet While among four wheel travelers(n=4) none were wearing the seat belt.



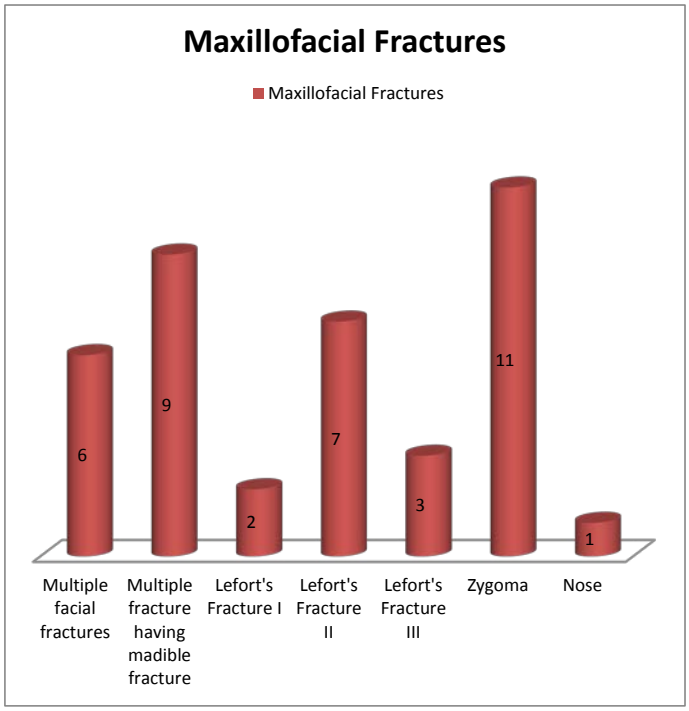
The history of alcohol consumption at time of trauma was assessed, 21 patients were under alcohol influence at time of injury and 20 among them were two wheeler traveler. However, there was no significance association between alcohol history and psychological disorders following trauma in our study.



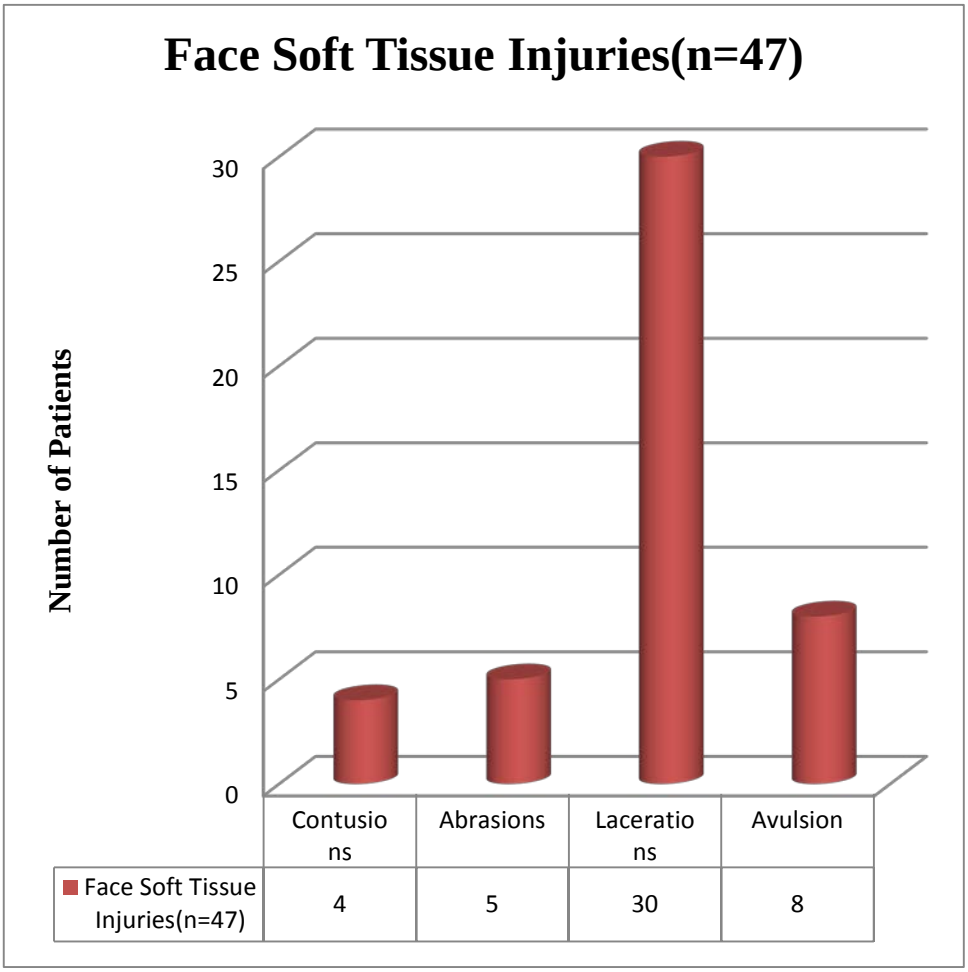
In our study, 84 patients had rod traffic accidents as mode of injury in that two wheeler travelers were the most common to get injury followed by four wheelers, auto rickshaw and pedestrians. The other causes were sports and fall which had one each patients.



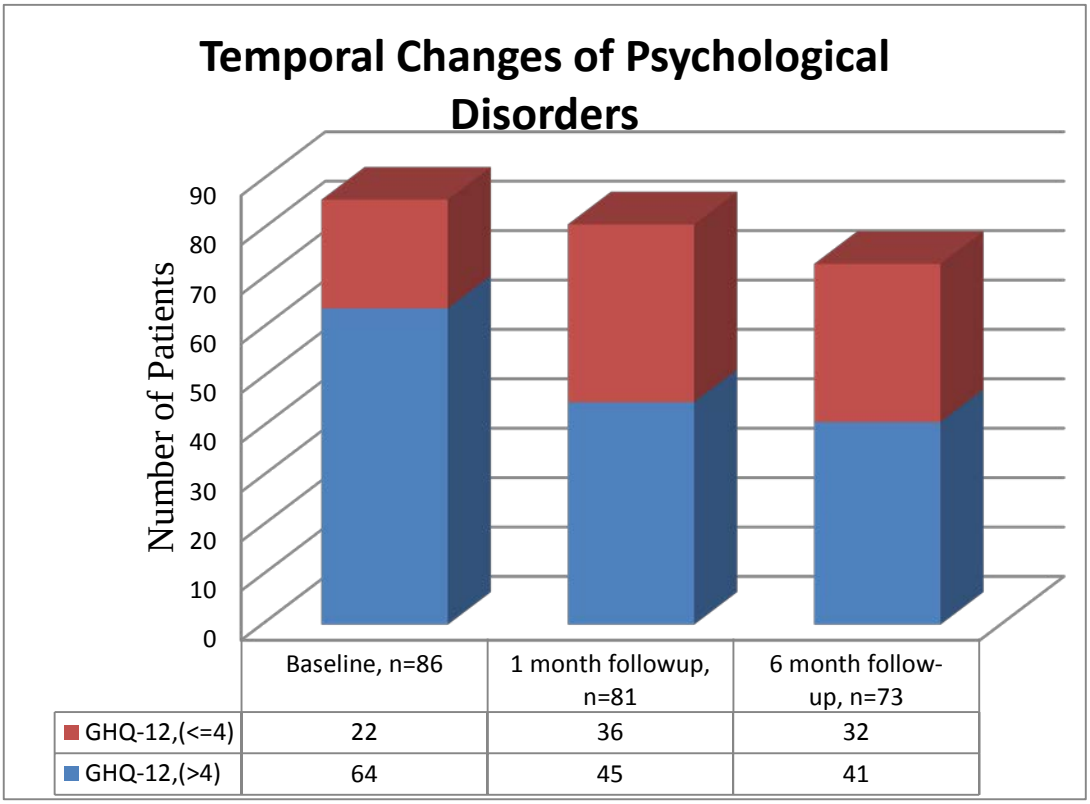
In our study, 47 patients had soft tissue injuries while 39 patients had maxillofacial fractures.



In our study, multiple fractures were present in 15 patients among that 9 patients had mandible fracture. Isolated fracture was most occurred in Zygoma fracture 11 patients, Lefort's II in 7 patients, Lefort's III in 3 patients and Lefort's I in 2 patients, one patient had nasal bone fracture.



The facial soft tissue injuries were in 47 patients, 30 patients had lacerations,8 patients had avulsion injuries, 5 patient had abrasions and 4 developed contusion.



The psychological disorder in general was assessed using screening tool GHQ-12 at baseline (10 days), first follow-up at one month and 2nd follow-up at 6th month. In our study, 74.4% had psychological disorder at baseline visit and 55.6% and 56.2% in subsequent visits.

Psychological disorder change from baseline and first follow-up

	GHQ-12 <=4 (First Follow-up)	GHQ-12 5-12 (First Follow-up)
GHQ-12 Score <=4(Baseline)	22	01
GHQ-12 Score 5-12(Baseline)	14	44

Chi –Square Test	.001

Psychological disorder change from first and second follow-up

	GHQ_12 <=4 (Second Follow-up)	GHQ-12 5-12 (Second Follow-up)
GHQ-12 Score <=4(First Follow-up)	31	02
GHQ-12 Score 5-12(First Follow-up)	01	39

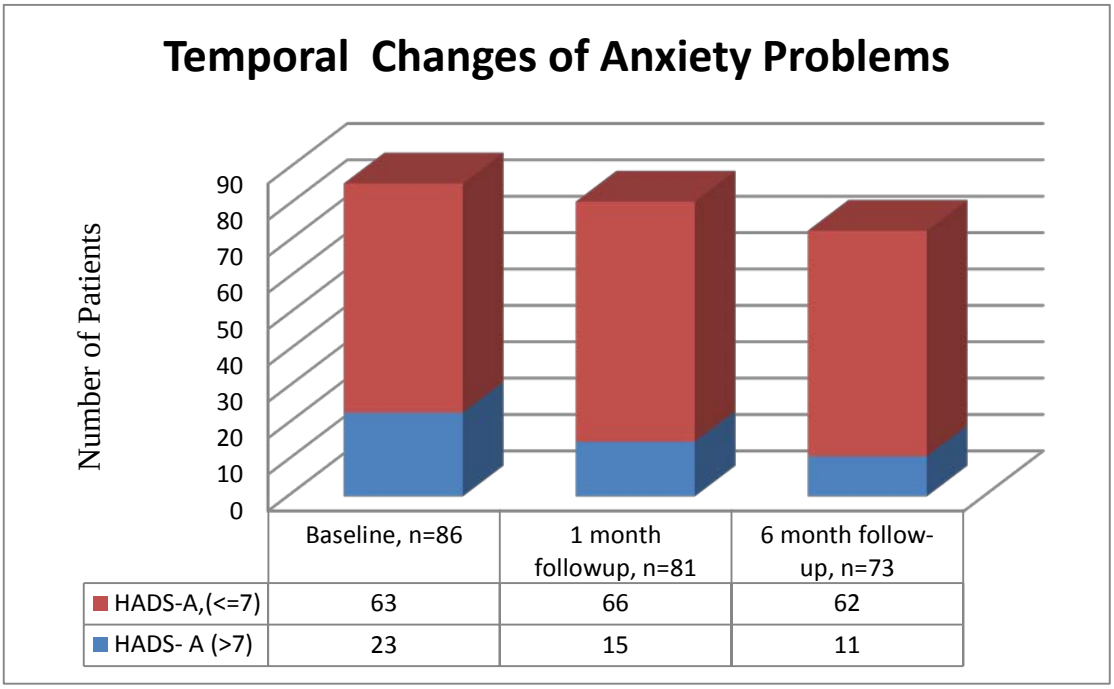
Chi-Square Test	.002

Psychological disorder change from baseline and second follow-up

	GHQ_12 <=4 (Second Follow-up)	GHQ-12 5-12 (Second Follow-up)
GHQ-12 Score <=4(Baseline)	19	1
GHQ-12 Score 5-12(Baseline)	13	40

Chi-Square Test	1.000

Psychological disorders were present in 58 persons among 81 persons who came for first follow up. Among those 58 patients 14(24.1%) patients who had psychological disorder at baseline did not had during first follow up assessment and among 73 patients assessed during third follow up, 53 had psychological disorder at baseline out of which 13 patients(24.5%) did not have psychological disorders at second follow up. Hence there is a statically significant decrease in psychological disorder during first follow up and second follow up than what was found at baseline. But there is no statistically significant change in psychological disorders between first and second follow up.



The anxiety problems was assessed using screening tool hospital anxiety and depression subscale for anxiety (HDS-A) at baseline (10 days), first follow-up at one month and 2nd follow-up at 6th month. In our study, 26.74% had anxiety disorder following trauma at baseline visit and 18.5% and 15.1% in subsequent visits.

Anxiety disorder change from baseline and first follow-up

	HADS-A Score<=7 (First Follow-up)	HADS-A Score 8-21 (First Follow-up)
HADS-A Score <=7(Baseline)	61	0
HADS-A Score 8-21(Baseline)	5	15

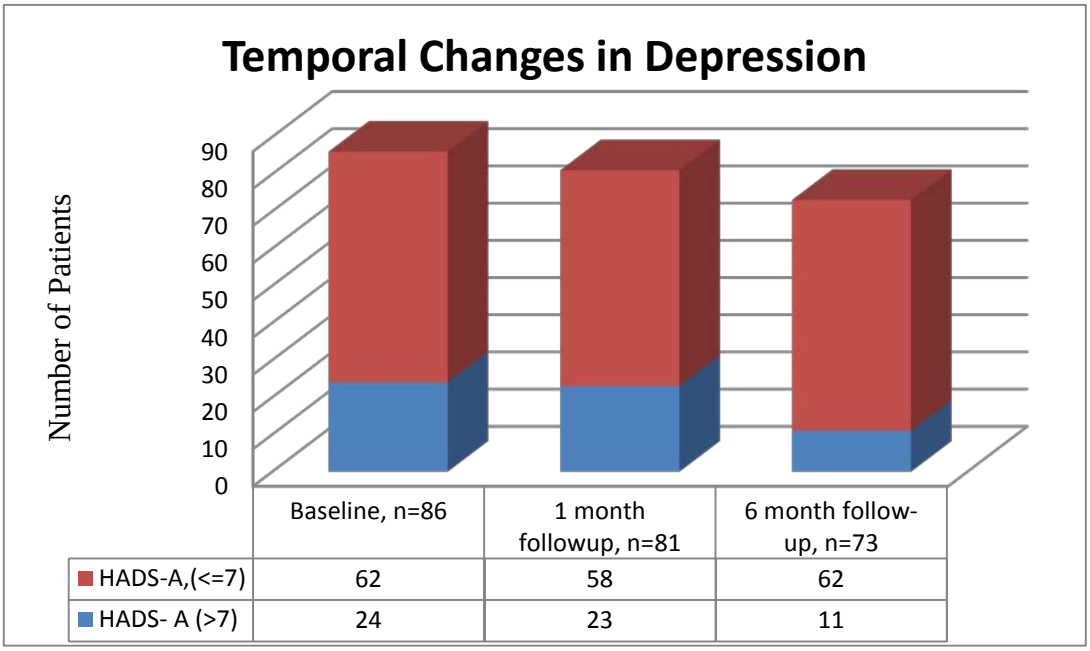
Chi-Square Test	0.062

Anxiety disorder change from baseline and second follow-up

	HADS-A Score<=7 (Second Follow-up)	HADS-A Score 8-21 (Second Follow-up)
HADS-A Score <=7(Baseline)	53	0
HADS-A Score 8-21(Baseline)	9	11

Chi-Square Test	0.004

Out of 81 who came for 1st follow up 20 had anxiety at baseline. Among the 20 persons with anxiety at baseline, 5 (25%) dint have anxiety at first follow up, however this decrease in persons with anxiety at first follow up is found to be statistically not significant. Likewise among the 73 who came for second follow up, 9(45%) people among the 20 at baseline dint have anxiety at second follow up and this decrease in anxiety from baseline was found to be stastically significant.



The depressive problems was assessed using screening tool hospital anxiety and depression subscale for depression (HDS-D) at baseline (10 days), first follow-up at one month and 2nd follow-up at 6th month. In our study, 27.9% had depressive disorders following trauma at baseline visit and 28.4% and 15.1% in subsequent visits.

Depressive disorder change from baseline and first follow-up

	HADS-D Score <=7 (First follow-up)	HADS-D Score 8-21 (First follow-up)
HADS-D Score <=7(Baseline)	54	3
HADS-D Score 8-21(Baseline)	4	20

Chi-Square Test	1.000

Depressive disorder change from baseline andsecondt follow-up

	HADS-D Score <=7 (Second follow-up)	HADS-D Score 8-21 (Second follow-up)
HADS-D Score <=7(Baseline)	49	0
HADS-D Score 8-21(Baseline)	13	11

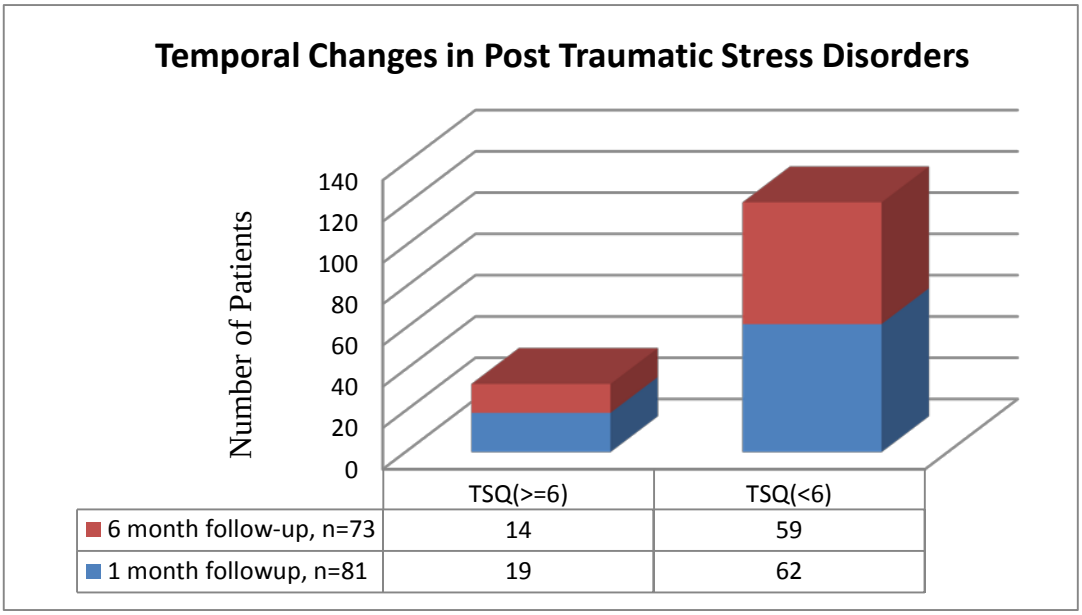
Chi-Square Test	0.000

Depressive disorder change from first and second follow-up

	HADS-D Score <=7 (Second follow-up)	HADS-D Score 8-21 (Second follow-up)
HADS-D Score <=7(First follow-up)	50	0
HADS-D Score 8-21(First follow-up)	12	11

Chi-Square Test	0.000

Out of 81 who came for 1st follow up 24 had depression at baseline. Among the 24 persons with depression at baseline, 4 (16.7%) dint have depression at first follow up, however this decrease in persons with depression at first follow up is found to be statistically not significant. Likewise among 24 people with depression at baseline ,13(54.2%) people dint have depression at second follow up and among the 23 people who had depression on first follow-up,12(52.5%) dint have depression on 2nd follow up . Thus there is statistically significant decrease in depression at second follow up than at baseline and at first follow up.



The post-traumatic stress disorder was assessed using screening tool trauma screening questionnaire at first follow-up at one month and 2nd follow-up at 6th month. In our study, following trauma post-traumatic stress disorders were detected in 23.5% and 26.03% patients.

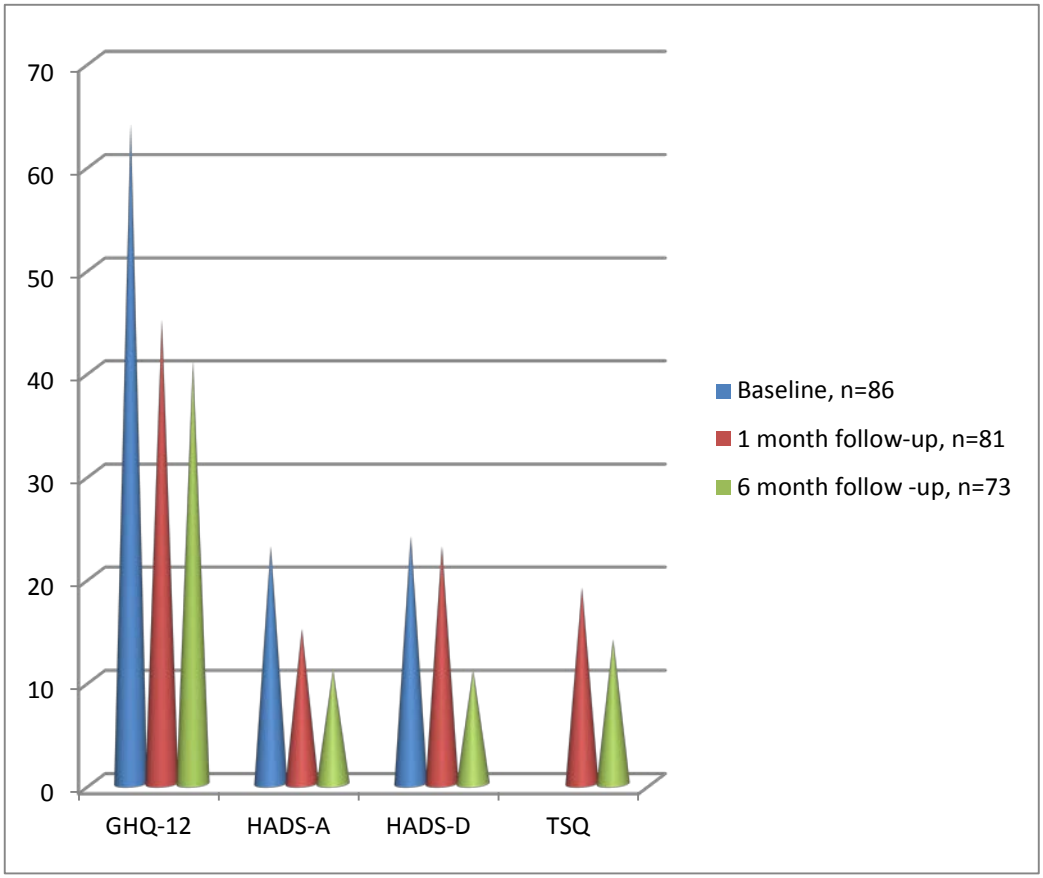
Post- traumatic stress disorder change from first follow-up to second follow-up

	TSQ Score <=7 (Second follow-up)	TSQ Score 8-21 (Second follow-up)
TSQ Score <=5(First follow-up)	54	0
TSQ Score 6-10(First follow-up)	5	14

Chi-Square Test	0.062

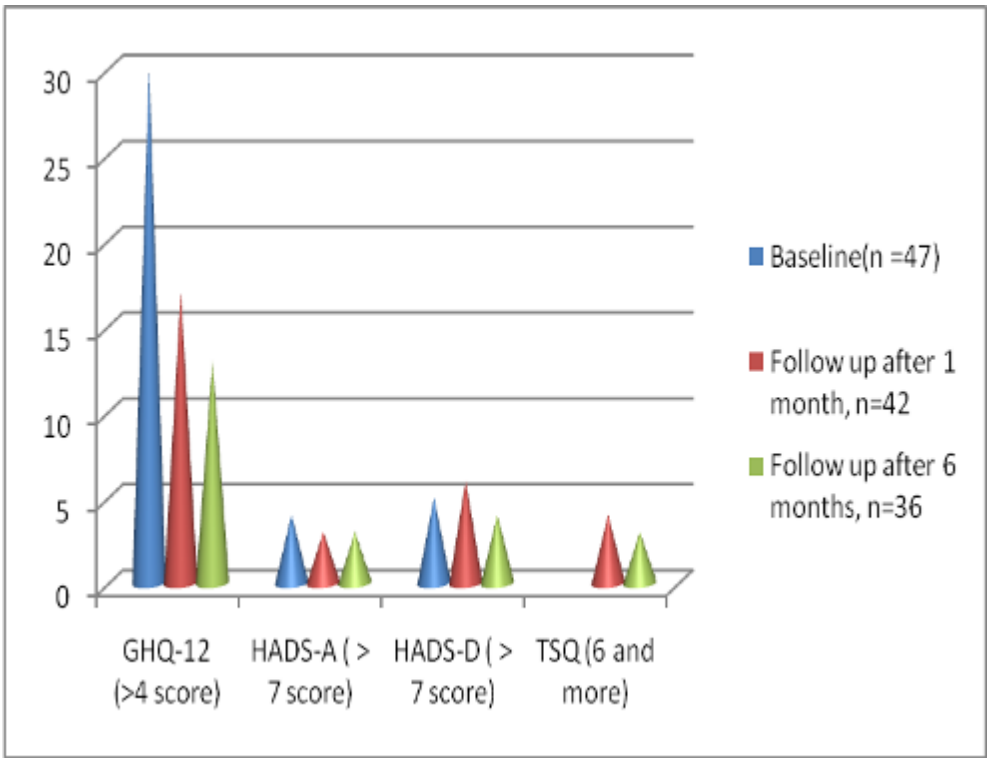
Among the 73 who came for second follow up 19 had post-traumatic stress at first follow up, out of which 5 (26.3%) dint have post-traumatic stress on second follow up. However this decrease in post-traumatic stress is found to be statistically not significant.

There were 86 maxillofacial trauma patients initially at baseline visit at 10th day, in 2nd visit the number of patients decreased to 81 and subsequently to 73 in 3rd visit..



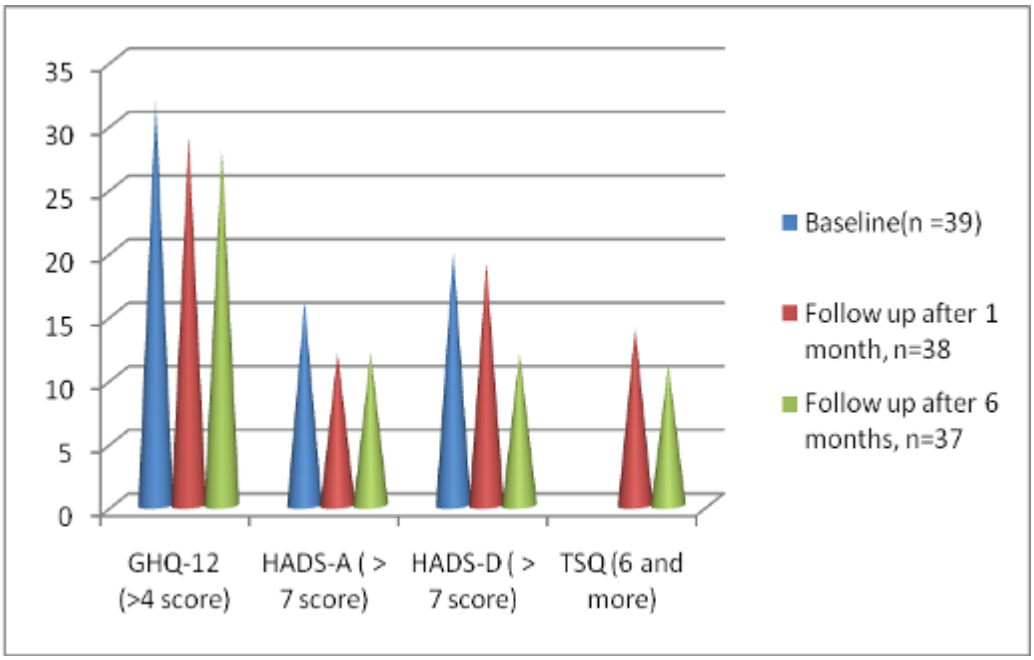
The above graph shows the temporal changes of psychological disorders, anxiety disorders, depressive disorders and post-traumatic stress disorders among maxillofacial trauma patients at 10th day, one month follow-up and 6 month follow-up.

There were 47 patients with soft tissue injuries initially at baseline visit at 10th day, in 2nd visit the number of patients decreased to 42 and subsequently to 36.



The above graph shows the temporal changes of psychological disorders, anxiety disorders, depressive disorders and post-traumatic stress disorders among patients with soft tissue injuries at 10th day, one month follow-up and 6 month follow-up.

There were 39 patients with maxillofacial fractures were initially at baseline visit at 10th day, in 2nd visit the number of patients decreased to 38 and subsequently to 37.



The above graph shows the temporal changes of psychological disorders, anxiety disorders, depressive disorders and post-traumatic stress disorders among patients with maxillofacial fractures at 10th day, one month follow-up and 6 month follow-up.

The psychological disorders among soft tissue injury and maxillofacial fracture patients at baseliline

	GHQ_12 <=4 (Baseline visit)	GHQ-12 5-12 (Baseline visit)
Soft Tissue Injuries	18	29
Maxillofacial Fractures	5	34

Among maxillofacial fracture patients the psychological disorder is more (GHQ score high group) which is 87.2% (34 patients) compare to the soft tissue injury patients, which is 61.7%(29patients), this difference is statistically significant ($p<0.05$).

The anxiety disorders among soft tissue injury and maxillofacial fracture patients at baseline

	HADS anxiety <=7 (Baseline visit)	HADS anxiety 8 and more (Baseline visit)
Soft Tissue Injuries	43	4
Maxillofacial Fractures	23	16

The anxiety problems were more in maxillofacial fractures with 41%(16 patients) compared to 8.5%(4 patients) with soft tissue injuries and was significant with $p<0.05$.

The depressive disorders among soft tissue injury and maxillofacial fracture patients at baseline

	HADS depression <=7 (Baseline visit)	HADS depression 8 and more (Baseline visit)
Soft Tissue Injuries	42	5
Maxillofacial Fractures	20	19

Among maxillofacial fracture patients the depressive disorder were more, 48.7% (19patients) compare to the soft tissue injury patients, which is 10.6% (5 patients), this difference is statistically significant ($p<0.05$).

The post-traumatic stress disorders among soft tissue injury and maxillofacial fracture patients at baseline

	TSQ <=5 (Baseline visit)	TSQ 6 and more (Baseline visit)
Soft Tissue Injuries	39	4
Maxillofacial Fractures	23	15

The post-traumatic stress disorders was found in 39.5% patients (15 patients) having maxillofacial fractures compared to 9.3% patients (4 patients). This increase in post-traumatic stress disorders among maxillofacial fracture patient was significant ($p<0.05$).

DISCUSSION

The present study "The psychological disorders following the maxillofacial trauma" was carried out in 86 patients following maxillofacial injuries treated in department of Plastic and Reconstructive surgery between 1st September 2013 to 31st August 2014 during follow up after treatment on 10^{th} day(baseline visit), one month (first follow-up visit) and on 6^{th} month (second follow-up visit).

Maxillofacial fractures were more among men compared to women in our study. In this study 85 males (94.2%) were injured in comparison to 05 females (5.8%). The male predominance may be due to the increased mobility of the male for work, as in our population usually males are usually responsible to earn for his family and they are usually more involved with outdoor activities like driving vehicles, sports and more prone to get involved in violent activities and problems following substance abuse. The females are comparatively involved with household work and are more careful in their day to day activities. The finding in this study was consistent with few other studies with similar pattern.[64, 65, 75-77, 87]

The trauma is considered common among young individuals because of their increase mobility for day to day activities, aggressive and violent behavior, problems related to substance abuse, rash and careless driving on the roads. The age group < 30 years was commonly involved in our study with 42 patients

injured. This can be attributed to the reason that it is in this age group most has to make frequent travel for education, job and leisure activities. These findings were similar in pattern with the other studies. [65,70,73,76]

There is increase in incidence of the accidents in India and can be attributed to more use of motor vehicles on road for travel purposes and due to poor discipline on road by violating traffic regulations. Sharing of the road by pedestrians and stray domestic animals are also common scenario in India road. The assault and increase violence are also on rise and can be attributed to the increasing unemployment, poor economic status and alcohol abuse. This study shows motor vehicle accidents accounted 95% of all maxillofacial injuries and were comparable with studies conducted by Van Beek et al[87] with increased motor vehicle accidents causing maxillofacial injuries >50%.A study by Yoffe et al.[88], has found falls as the main cause for maxillofacial injuries whereas a study by others has revealed daily activities and sports as the main cause.[89] The studies conducted by Kontio et al[68] and Kapoor et al[90] have found fights and assaults as the main cause for maxillofacial injuries. Thus, the cause of maxillofacial fractures can vary from country to country and decrease motor vehicle accidents can be due to strict regulations for traffic.

Consumption of alcohol is strongly associated with maxillofacial injuries, as alcohol impairs judgment which often leads to violence and is a

major factor in motor vehicle accidents.[69] In our study 21 patients (24%) were intoxicated at the time of injury and 20 patients had road traffic accidents while travelling on two wheeler under influence of alcohol. In study conducted by Chandra Sekar BR et al[82] and Zix JA et al[83], incidence of alcohol intoxication was 58% and 13% respectively. In study, Al Ahmed et al.[84] reported nil alcohol consumption in patient's presented with maxillofacial injuries in Sharjah. This can be explained by the fact of strict law in sales and consumption of alcohol which is effective in preventing alcohol related injuries.

In our study 40 subjects (46.5%) were educated more than higher secondary while 46 subjects (53.5%) were educated less than higher secondary which included illiterate individuals.

The 38 subjects were unemployed (44%) in our study. The lack of adequate education and lack of job for earning leads to poor socioeconomic condition and cause stress to the person as well as burden to the family, that can further be worsened by problems due to substance abuse and behavioral changes. [85]

The two wheeler causing road traffic accidents were most among the cause for maxillofacial injuries in our study and 88% of the travelers were not wearing helmets for safety measures. The ignorance of not wearing helmet

while driving had been discussed in studies done by Jayadevan et al.[56] and Sharma et al.[55] These scenarios highlights the poor legislations and lack of discipline in traffic rules that can lead to increase in traffic related morbidity as well as mortality.

All of the four subjects with maxillofacial injuries that occurred while travelling in four wheeler were not using seat belts. Adequate safety measures like using seat belts and airbags in four wheelers can avoid such trauma. [71]

Change in behavior change in driving vehicle and anxiety while travels were described in studies.[86] In our study 29(35.37%) subjects out of 82 had travel anxiety following the incident of trauma. This change in behavior for travelling can be associated with limitations in their everyday life. In our study, history of previous trauma was also taken but none of them had previous trauma.

The study also assessed the injury pattern and noted to have soft tissue injuries in 47(54.65%, n=86) patients of which 30 (34.88%, n=86) subjects had laceration injuries, 8 (9.3%, n=86) had avulsion injuries, 5(5.8%, n=86) had abrasion injuries and 4 (4.65%, n=86) had contusion. The soft tissue injuries was reported in a study done in Nigeria with subjects having lacerations (56.5%), contusion (12.9%) and avulsion (8.8%) as soft tissue injuries. [77]

Maxillofacial fracture pattern included multiple bone fractures and isolated facial bone fractures. In our study, majority had multiple facial bone fractures and was reported in 15(17.44%, n= 86) patients with 9 of this subjects having mandible fracture. The parasymphysis fracture was the common type of mandible fracture found in these injuries, although none had isolated mandible fracture. Among the isolated facial bone fractures found, zygoma fracture was the most common followed by Le Fort's II fracture and Le Fort's III fracture. Various studies have different patterns of fractures in maxillofacial region and in majority among them mandible is the most common facial bone getting involved. In few studies done in India reported zygoma as the most common bone fractured in midface and mandible being most common in lower third face, parasymphysis fracture being commonest in them. [64-66]

The soft tissue injuries were treated depending upon types of injury. The lacerations and avulsion injuries were managed by closure of the wound after adequate cleaning whereas simple abrasions and contusions were managed conservatively.

Most of the maxillofacial fractures were treated by open reduction and internal fixation, with in addition intermaxillary fixation for Le Fort's fracture and mandible fractures to achieve tooth in normal occlusion.

Anxiety, depression and post-traumatic stress disorders were the psychological problems screened among the subjects in this study using instruments hospital anxiety and depression scale (HADS), general health questionnaire-12(GHQ-12) and trauma screening questionnaire (TSQ). The psychological distress was present in 86% subjects at baseline visit and subsequently on 1st and 2nd follow-up 55.6% and 57.5% subjects. In a similar study done by Ukpong et al. 90% participants had psychological disorders and it was at higher rate throughout the studies.

In our study, depression was found on HADS depression subscale in 27.9% subjects at baseline visit while in 27.2% and 20.5% subjects on 1st and 2nd follow-up evaluation. Ukpong et al,(3) reported 41.2% subjects having depression at baseline and 47.1% and 21.7% subjects on 2nd and 3rd follow up and found significant fall in depression at second follow up screening.

Anxiety determined on HADS anxiety subscale was in 26.74% subjects at baseline visit while 18.5% and 17.4% subjects in subsequent follow ups. Ukpong et al.(75) reported 11.4% subjects with anxiety at baseline and 3% subjects on 1st follow up whereas 13% in 2nd follow up.

In our study, the post-traumatic stress disorder was assessed during the trauma screening questionnaire at first follow-up and second follow-up. The post-traumatic stress disorders were detected to be in 23.6% and 26.03% during

this time. Ukpong et al. [75]) reported 3% and 17.4% were diagnosed with post-traumatic stress disorders in their study at 1st and 2nd follow-up.

Psychological disorders were present in 58 persons among 81 persons who came for first follow up. Among those 58 patients 14(24.1%) patients who had psychological disorder at baseline did not had during first follow up assessment and among 73 patients assessed during second follow up, 53 had psychological disorder at baseline out of which 13 patients(24.5%) did not have psychological disorders at second follow up. Hence there is a statistically significant decrease in psychological disorder during first follow up and second follow up than what was found at baseline visit.

But there is no statistically significant change in psychological disorders between first and second follow up.

During first follow-up, out of 81 patients 20 patients had anxiety at baseline. Among the 20 persons with anxiety at baseline, 5 (25%) didn't have anxiety at first follow up, however this decrease in persons with anxiety at first follow up is found to be statistically not significant. Likewise among the 73 who came for second follow up, 9(45%) people among the 20 at baseline dint have anxiety at second follow up and this decrease in anxiety from baseline was found to be statistically significant.

During first follow-up, out of 81 patients 24 had depression at baseline. The 24 persons with depression at baseline, 4 (16.7%) dint have depression at first follow up, however this decrease in persons with depression at first follow up is found to be statistically not significant. Likewise among 24 people with depression at baseline ,13(54.2%) people dint have depression at second follow up and among the 23 people who had depression on first follow-up,12(52.5%) dint have depression on 2nd follow up . Thus there is statistically significant decrease in depression at second follow up from baseline visit and at first follow up.

Among the 73 patients who came for second follow up 19 patients had post-traumatic stress disorder at first follow up, out of which 5 (26.3%) dint have post-traumatic stress on second follow up. However this decrease in post-traumatic stress is found to be statistically not significant.

This temporal change in pattern of psychological disorders were also been discussed in various studies with decrease in anxiety and depression with increase in duration since injury while the post traumatic stress disorders may persists long and were reported even after 6 months.[59]

In our study the psychological disorders assessed by screening with GHQ-12 among face soft tissue injury patients and patients with maxillofacial fractures, the 87.2% patients with maxillofacial fractures were having psychological disorders while only 61.7% patients with soft tissue injuries were having psychological disorders. The increase in psychological disorders among the maxillofacial fracture patients was significant ($p<0.05$).

The anxiety and depression were also assessed among them and found to have 41% patients with fractures and 8% patients with soft tissue injuries to have anxiety problems whereas 48.7% patients with fractures and 10.6% patients with soft tissue injuries to have depressive disorders. The finding of increase in anxiety and depression among fracture patients compared to soft tissue injury patient was significant.

Similarly, there was significant increase in post-traumatic stress disorders among maxillofacial fracture patient with 39.5% compared to 9.3% in soft tissue injury patients.

SUMMARY

The present study “The psychological disorders following the maxillofacial trauma” was carried out in 86 patients following maxillofacial injuries treated in department of Plastic and Reconstructive surgery between 1st September 2013 to 31st August 2014 during follow up after treatment on 10th day(baseline visit), one month(1^{st} follow-up) and on 6th month (2^{nd} follow-up).

The study had 86 patients during baseline visit at 10th day, 85 patients were male and 5 were females.

The age group , <30 years were most commonly involved with maxillofacial trauma with 42 patients in this group while 33 patients were in age group 30-45 years and 11 patients in age group >45years.

Forty six patients with maxillofacial were educated less than higher secondary whereas 40 were educated more than higher secondary level. The occupational status were also assessed with 38 patients were unemployed whereas 48 patients were employed.

The alcohol was the intoxicating substance abuse commonly consumed among the traumatized patient and 21 patients gave history of alcohol intake at the time of injury, among this 20 patients mode of injury was two wheeler.

The mode of injury most common was road traffic accidents from two wheeler accounting 76 patients, four wheeler 4 patients , auto rickshaw 2 patients, pedestrian injury 2 patients, sports injury 1 patient and other injury cause following fall from bullock cart 1 patient.

The safety measures taken by motor vehicle travelers were assessed, 75 two wheeler were not using helmet and none of the four wheeler traveler used seat belt for safety while travelling.

The pattern of injury also was analyzed, 39 patients had maxillofacial fractures and 47 patients had soft tissue injuries. Among these maxillofacial fracture patients 15 had multiple facial fractures with 9 patients having associated mandible fracture, 11 patients were having isolated zygoma fracture, 7 patients had isolated Le Fort's 2 fracture and 3 patients had Le Fort's III and 2 patients had Le Fort's 1 fracture and only one patient was having isolated nasal bone fracture. Among the soft tissue injuries 30 patients had laceration injury, 8 with avulsion injury, 5 with abrasion and 4 patients had only contusion.

In our study, 29 patients among 82 with mode of injury road traffic accident developed travel anxiety.

The psychological disorders were assessed using GHQ-12 questionnaire and found to have 86% patients at baseline visit, 55.6% at 1st follow up and 57.5% during 2nd follow-up. The temporal change was also analyzed with significant decrease in the psychological disorders among patients in first and second follow up studies.

The anxiety problem was assessed using HADS anxiety subscale, 27.9% patients had anxiety at baseline visit, 27.2% and 20.5% patients developed anxiety on

subsequent first and second follow-up. There was significant decrease in anxiety problems during second follow-up than first follow-up.

The depressive disorders was assessed using HADS depression subscale, 26.74% patients had anxiety at baseline visit, 18.5% and 17.4% patients developed depression on subsequent first and second follow-up. There was significant decrease in depression disorders during second follow-up than first follow-up.

The post-traumatic stress disorders was screened using trauma screening questionnaire (TSQ) with 23.6% and 26.03% patients having disorder at first and second follow-up with persisting problem during second follow-up.

The psychological disorders, anxiety and depressive disorders as well as post-traumatic stress disorders were found more among maxillofacial fracture patients than the patient with soft tissue injuries.

CONCLUSION

In this study, the psychological disorders were detected among the patients following maxillofacial trauma. The early detection and adequate measures should be taken to prevent such psychological impact. Hence, along with specialised trauma care it is necessary to integrate psychological care as a part of multidisciplinary team treating maxillofacial trauma patients.

BIBLIOGRAPHY

1. Joshipura MK, Shah HS, Patel PR, Divatia PA, Desai PM. Trauma care systems in India. Injury. 2003 Sep;34(9):686–92.

2. Cunningham SJ. The psychology of facial appearance. Dent Update. 1999 Dec;26(10):438–43.

3. Bisson JI, Shepherd JP, Dhutia M. Psychological sequelae of facial trauma. J Trauma. 1997 Sep;43(3):496–500.

4. Enqvist B, von Konow L, Bystedt H. Pre- and perioperative suggestion in maxillofacial surgery: effects on blood loss and recovery. Int J Clin Exp Hypn. 1995 Jul;43(3):284–94.

5. Brill SE, Clarke A, Veale DM, Butler PEM. Psychological management and body image issues in facial transplantation. Body Image. 2006 Mar;3(1):1–15.

6. Edwin Smith. Papyrus(translated by Breasted):The Edwin Smith surgical papyrus. University of Chicago Press; 1930.

7. Siegert R, Weerda H. Immobilization of fractures of the facial skeleton: past and present. Facial Plast Surg FPS. 1990;7(3):137–51.

8. Aziz SR. A history of the treatment of jaw fractures. J Mass Dent Soc. 1993;42(4):200–3.

9. Stimson L. Fractures of the inferior maxilla. Treatise of fractures. London: Churchill; 1893. p. 284–94.

10. Rowe NL. The history of the treatment of maxillo-facial trauma. Ann R Coll Surg Engl. 1971;49(5):329.

11. Mukerji R, Mukerji G, McGurk M. Mandibular fractures: Historical perspective. Br J Oral Maxillofac Surg. 2006 Jun;44(3):222–8.

12. A treatise on oral deformities as a branch of mechanical surgery by Kingsley Norman W. (Norman William): - E-Books Delivery Service [Internet]. [cited 2015 Mar 16]. Available from: http://www.abebooks.com/servlet/BookDetailsPL?bi=9924565011&searchurl=tn%3Da+treatise+on+oral+deformities%26an%3Dkingsley

13. Devlin DH. A historical review of dental and facial skeletal trauma. J Calif Dent Assoc. 1996 Feb;24(2):29–34.

14. Rene Le FOrt. Etude experimentale sur les fractures de la machoire superieure. Rev Chir. 1901;23:208.

15. 10. Gilles HD, Kilner TP, Stone D. Fractures of the malar-zygomatic ompound, with a description of a new X-ray position. Br J Surg. 1927;14:651.

16. Michelet FX, Dessus B, Benoit JP, Moll A. [Mandibular osteosynthesis without blocking by screwed miniature stellite plates]. Rev Stomatol Chir Maxillofac. 1973 May;74(3):239–45.

17. Champy M, Lodde JP. [Mandibular synthesis. Placement of the synthesis as a function of mandibular stress]. Rev Stomatol Chir Maxillofac. 1976 Dec;77(8):971–6.

18. Ylikontiola L, Sundqvuist K, Sàndor GKB, Törmälä P, Ashammakhi N. Self-reinforced bioresorbable poly-L/DL-lactide [SR-P(L/DL)LA] 70/30 miniplates and miniscrews are reliable for fixation of anterior mandibular fractures: a pilot study. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2004 Mar;97(3):312–7.

19. Moore Keith L Anne M. R., Agur,Arthur F. Moore's clinical anatomy. 6th ed. United States of America: Lippincott Williams & Wilkins; 2010. 843–980 p.

20. Janelle E.K Meuten, Katharine Powers, David E.Frost, Barry D. Kendell. Applied Surgical Anatomy of the Head and Neck. Oral and Maxillofacial Trauma, FONSECA. 4th ed. 3251 Riverport Lane, St.Louis Missouri: Elsevier Saunders; 2013. p. 181–90.

21. Raymond J.Fonseca, James A. Bertz, Michael P.Powers, Barry W.Beck, Jaes B.Holton. Management of Soft Tissue Injuries. Oral and Maxillofacial Trauma, FONSECA. 4th ed. 3251 Riverport Lane, St.Louis Missouri: Elsevier Saunders; 2013. p. 525–6.

22. Gillespie JE, Isherwood I, Barker GR, Quayle AA. Three-dimensional reformations of computed tomography in the assessment of facial trauma. Clin Radiol. 1987 Sep;38(5):523–6.

23. Markowitz BL, Manson PN, Sargent L, Vander Kolk CA, Yaremchuk M, Glassman D, et al. Management of the medial canthal tendon in nasoethmoid orbital fractures: the importance of the central fragment in classification and treatment. Plast Reconstr Surg. 1991 May;87(5):843–53.

24. Hendrickson M, Clark N, Manson PN, Yaremchuk M, Robertson B, Slezak S, et al. Palatal fractures: classification, patterns, and treatment with rigid internal fixation. Plast Reconstr Surg. 1998 Feb;101(2):319–32.

25. Knight JS, North JF. The classification of malar fractures: an analysis of displacement as a guide to treatment. Br J Plast Surg. 1961 Jan;13:325–39.

26. Manson PN, Markowitz B, Mirvis S, Dunham M, Yaremchuk M. Toward CT-based facial fracture treatment. Plast Reconstr Surg. 1990 Feb;85(2):202–12; discussion 213–4.

27. Dingman RO, Natvig P. Surgery of Facial Fractuers. Philadelphia: WB Saunders; 1964.

28. Surgical treatment of facial injuries. 3rd ed. Baltimore: Williams and Wilkins; 1974.

29. Rowe NL, Killey HC. General considerations and classification of mandibular fractures. Baltimore: Williams & Wilkins; 1955.

30. Kruger GO. Textbook of Oral Surgery. 4th ed. St.Louis: Mosby; 1974.

31. Kruger E, Schilli W. Oral and Maxillofacial Traumatology. Quintessence. Chicago; 1982.

32. Shetty V, Atchison K, Der-Matirosian C, Wang J, Belin TR. The mandible injury severity score: development and validity. J Oral Maxillofac Surg Off J Am Assoc Oral Maxillofac Surg. 2007 Apr;65(4):663–70.

33. Brian M.Smith, Atul M.Deshmukh, H.Dexter Barber,Raymond J.Fonseca. Mandbible Fractures. Oral and Maxillofacial Trauma, FONSECA. 4th ed. 3251 Riverport Lane, St.Louis Missouri: Elsevier Saunders; 2013. p. 299.

34. Loukota RA, Eckelt U, De Bont L, Rasse M. Subclassification of fractures of the condylar process of the mandible. Br J Oral Maxillofac Surg. 2005 Feb;43(1):72–3.

35. World Health Organization. World health statistics [Internet]. Geneva: World Health Organization; 2010 [cited 2015 Mar 16]. Available from: http://site.ebrary.com/id/10393307

36. Van Horn ER. Loss and depression after traumatic injury: the importance of case management in the recovery process. Prof Case Manag. 2009 Apr;14(2):66–73; quiz 74–5.

37. Richmond TS, Kauder D, Hinkle J, Shults J. Early predictors of long-term disability after injury. Am J Crit Care Off Publ Am Assoc Crit-Care Nurses. 2003 May;12(3):197–205.

38. Wiseman T, Foster K, Curtis K. Mental health following traumatic physical injury: an integrative literature review. Injury. 2013 Nov;44(11):1383–90.

39. Andrew NE, Gabbe BJ, Wolfe R, Williamson OD, Richardson MD, Edwards ER, et al. Twelve-month outcomes of serious orthopaedic sport and active recreation-related injuries admitted to Level 1 trauma centers in Melbourne, Australia. Clin J Sport Med Off J Can Acad Sport Med. 2008 Sep;18(5):387–93.

40. Joy D, Probert R, Bisson JI, Shepherd JP. Posttraumatic stress reactions after injury. J Trauma. 2000 Mar;48(3):490–4.

41. Zatzick D, Jurkovich GJ, Rivara FP, Wang J, Fan M-Y, Joesch J, et al. A national US study of posttraumatic stress disorder, depression, and work and functional outcomes after hospitalization for traumatic injury. Ann Surg. 2008 Sep;248(3):429–37.

42. O'Donnell ML, Creamer M, Pattison P. Posttraumatic stress disorder and depression following trauma: understanding comorbidity. Am J Psychiatry. 2004 Aug;161(8):1390–6.

43. Michaels AJ, Michaels CE, Moon CH, Smith JS, Zimmerman MA, Taheri PA, et al. Posttraumatic stress disorder after injury: impact on general health outcome and early risk assessment. J Trauma. 1999 Sep;47(3):460–6; discussion 466–7.

44. Amstadter AB, Vernon LL. Emotional Reactions During and After Trauma: A Comparison of Trauma Types. J Aggress Maltreatment Trauma. 2008 Jul 1;16(4):391–408.

45. Mayou R, Bryant B. Outcome 3 years after a road traffic accident. Psychol Med. 2002 May;32(4):671–5.

46. Islam S, Ahmed M, Walton GM, Dinan TG, Hoffman GR. The association between depression and anxiety disorders following facial trauma--a comparative study. Injury. 2010 Jan;41(1):92–6.

47. Bryant RA, O'Donnell ML, Creamer M, McFarlane AC, Clark CR, Silove D. The psychiatric sequelae of traumatic injury. Am J Psychiatry. 2010 Mar;167(3):312–20.

48. Bryant RA, Moulds M, Guthrie R, Nixon RDV. Treating acute stress disorder following mild traumatic brain injury. Am J Psychiatry. 2003 Mar;160(3):585–7.

49. Zatzick D, Jurkovich G, Russo J, Roy-Byrne P, Katon W, Wagner A, et al. Posttraumatic distress, alcohol disorders, and recurrent trauma across level 1 trauma centers. J Trauma. 2004 Aug;57(2):360–6.

50. McKibben JBA, Bresnick MG, Wiechman Askay SA, Fauerbach JA. Acute stress disorder and posttraumatic stress disorder: a prospective study of prevalence, course, and predictors in a sample with major burn injuries. J Burn Care Res Off Publ Am Burn Assoc. 2008 Feb;29(1):22–35.

51. Motamedi MHK. An assessment of maxillofacial fractures: a 5-year study of 237 patients. J Oral Maxillofac Surg Off J Am Assoc Oral Maxillofac Surg. 2003 Jan;61(1):61–4.

52. Bakardjiev A, Pechalova P. Maxillofacial fractures in Southern Bulgaria - a retrospective study of 1706 cases. J Cranio-Maxillo-fac Surg Off Publ Eur Assoc Cranio-Maxillo-fac Surg. 2007 Apr;35(3):147–50.

53. Mayou R, Bryant B. Consequences of road traffic accidents for different types of road user. Injury. 2003 Mar;34(3):197–202.

54. Mayou R, Tyndel S, Bryant B. Long-term outcome of motor vehicle accident injury. Psychosom Med. 1997 Dec;59(6):578–84.

55. Sharma R, Grover VL, Chaturvedi S. Suicidal behavior amongst adolescent students in south Delhi. Indian J Psychiatry. 2008;50(1):30–3.

56. Sreedharan J, Muttappillymyalil J, Divakaran B, Haran JC. Determinants of safety helmet use among motorcyclists in Kerala, India. J Inj Violence Res. 2010 Jan;2(1):49–54.

57. SW Au Yong L. The physical and psychological morbidity in maxillofacial trauma patients. Annal Dent Univ Malaya. 1999;6:8–10.

58. Laskin DM. The psychological consequences of maxillofacial injury. J Oral Maxillofac Surg Off J Am Assoc Oral Maxillofac Surg. 1999 Nov;57(11):1281.

59. Lento J, Glynn S, Shetty V, Asarnow J, Wang J, Belin TR. Psychologic functioning and needs of indigent patients with facial injury: a prospective controlled study. J Oral Maxillofac Surg Off J Am Assoc Oral Maxillofac Surg. 2004 Aug;62(8):925–32.

60. Mayou R, Bryant B. Outcome in consecutive emergency department attenders following a road traffic accident. Br J Psychiatry J Ment Sci. 2001 Dec;179:528–34.

61. Mayou R, Simkin S, Threlfall J. The effects of road traffic accidents on driving behaviour. Injury. 1991 Sep;22(5):365–8.

62. Hull AM, Lowe T, Devlin M, Finlay P, Koppel D, Stewart AM. Psychological consequences of maxillofacial trauma: a preliminary study. Br J Oral Maxillofac Surg. 2003 Oct;41(5):317–22.

63. Shepherd JP, Qureshi R, Preston MS, Levers BG. Psychological distress after assaults and accidents. BMJ. 1990 Oct 13;301(6756):849–50.

64. Snehal Bansod, Sanjay Jadwani, Anshul Khandelwal, Ajit Mishra, Sarbani Deb Sikdar,Vikas Meshram. Incidences, Etiology, Fracture Patterns And Geographical Distribution of Maxillofacial Injuries Reported At Government Dental College and Hospital,Raipur, Chhattisgarh state, India. Chhattisgarh Journal of Health Science. 2013 Dec;1(1):28–31.

65. Amiya et al. Maxillofacial fracture patterns in North Indian urban population. Journal of Dental Sciences and Research. Journal of Dental Science and Research. 2013;4(1):1–4.

66. Dr. Rajanikanth K,.Dr.R..M.Borle,Dr.Nitin Bhola,Dr.Shivam. The pattern of maxillofacial fractures in central India A Unicentric retrospective study. IOSR Journal of Dental and Medical Sciences. 2014 Feb;13(1):28–31.

67. Loxha M, Sejfija O, Salihu S, Gjinolli F, Agani Z, Hamiti V, et al. Maxillofacial Fractures: Twenty Years of Study in the Department of Maxillofacial Surgery in Kosovo. Mater Socio Medica. 2013;25(3):187.

68. Kontio R, Suuronen R, Ponkkonen H, Lindqvist C, Laine P. Have the causes of maxillofacial fractures changed over the last 16 years in Finland? An epidemiological study of 725 fractures. Dent Traumatol Off Publ Int Assoc Dent Traumatol. 2005 Feb;21(1):14–9.

69. Trends in Facial Injury: Increasing Violence More than Compensates for Decreasing Road Trauma. British Medical Journal. 1998 Jan 31;316(7128):325–6.

70. Deogratius BK, Isaac MM, Farrid S. Epidemiology and management of maxillofacial fractures treated at Muhimbili National Hospital in Dar es Salaam, Tanzania, 1998-2003. Int Dent J. 2006 Jun;56(3):131–4.

71. Cormier J, Duma S. The epidemiology of facial fractures in automotive collisions. Annu ProceedingsAssociation Adv Automot Med [Internet]. 2009 [cited 2015 Mar 16]; Available from: http://www.brconline.com/files/consultants/107/article_13.pdf

72. Shepherd J, Brickley M. The Relationship Between Alcohol Intoxication, Stressors and Injury in Urban Violence. Br J Criminol. 1996 Sep 21;36(4):546–66.

73. Simpson HM, Mayhew DR. Youth and Traffic Accidents. Can Fam Physician. 1987;33:429.

74. Mayou R, Bryant B, Duthie R. Psychiatric consequences of road traffic accidents. Bmj. 1993;307(6905):647–51.

75. Ukpong DI, Ugboko VI, Ndukwe KC, Gbolahan O. Psychological complications of maxillofacial trauma: preliminary findings from a Nigerian university teaching hospital. J Oral Maxillofac Surg Off J Am Assoc Oral Maxillofac Surg. 2007 May;65(5):891–4.

76. Glynn SM. The psychosocial characteristics and needs of patients presenting with orofacial injury. Oral Maxillofac Surg Clin N Am. 2010 May;22(2):209–15.

77. Olayemi AB, Adeniyi AO, Samuel U, Emeka OA. Pattern, severity, and management of cranio-maxillofacial soft-tissue injuries in Port Harcourt, Nigeria. J Emerg Trauma Shock. 2013 Oct;6(4):235–40.

78. Sen P, Ross N, Rogers S. Recovering maxillofacial trauma patients: the hidden problems. J Wound Care. 2001 Mar;10(3):53–7.

79. Spielberger, C. D. State-Trait Anxiety Inventory: Bibliography. 2nd ed. Palo Alto: CA: Consulting Psychologists Press.; 1989.

80. Goldberg DP, Hillier VF. A scaled version of the General Health Questionnaire. Psychol Med. 1979 Feb;9(1):139–45.

81. Goldberg DP, Gater R, Sartorius N, Ustun TB, Piccinelli M, Gureje O, et al. The validity of two versions of the GHQ in the WHO study of mental illness in general health care. Psychol Med. 1997 Jan;27(1):191–7.

82. Chandra Shekar BR, Reddy C. A five-year retrospective statistical analysis of maxillofacial injuries in patients admitted and treated at two hospitals of Mysore city. Indian J Dent Res Off Publ Indian Soc Dent Res. 2008 Dec;19(4):304–8.

83. Zix JA, Schaller B, Lieger O, Saulacic N, Thorén H, Iizuka T. Incidence, aetiology and pattern of mandibular fractures in central Switzerland. Swiss Med Wkly. 2011;141:w13207.

84. Al Ahmed HE, Jaber MA, Abu Fanas SH, Karas M. The pattern of maxillofacial fractures in Sharjah, United Arab Emirates: a review of 230 cases. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2004 Aug;98(2):166–70.

85. McDade AM, McNicol RD, Ward-Booth P, Chesworth J, Moos KF. The aetiology of maxillo-facial injuries, with special reference to the abuse of alcohol. Int J Oral Surg. 1982 Jun;11(3):152–5.

86. Mayou RA, Bryant BM. Effects of road traffic accidents on travel. Injury. 1994 Sep;25(7):457–60.

87. Van Beek G j., Merkx C a. Changes in the pattern of fractures of the maxillofacial skeleton. Int J Oral Maxillofac Surg. 1999 Dec 1;28(6):424–8.

88. Yoffe T, Shohat I, Shoshani Y, Taicher S. [Etiology of maxillofacial trauma--a 10-year survey at the Chaim Sheba Medical Center, Tel-Hashomer]. Harefuah. 2008 Mar;147(3):192–6, 280.

89. Gassner R, Tuli T, Hächl O, Rudisch A, Ulmer H. Cranio-maxillofacial trauma: a 10 year review of 9,543 cases with 21,067 injuries. J Cranio-Maxillo-fac Surg Off Publ Eur Assoc Cranio-Maxillo-fac Surg. 2003 Feb;31(1):51–61.

90. Kapoor P, Kalra N. A retrospective analysis of maxillofacial injuries in patients reporting to a tertiary care hospital in East Delhi. Int J Crit Illn Inj Sci. 2012 Jan;2(1):6–10.

91. Goldberg D: General Health Questionnaire (GHQ-12). Windsor, UK: NFER-Nelson; 1992.

92. Zigmond AS, Snaith RP: The Hospital Anxiety and Depression Scale. Acta Psychiatr Scand 67:361, 1983

93. 8. Brewin CR, Rose S, Andrews B, et al: (2002). Brief screening instrument for post-traumatic stress disorder. Br J Psychiatry 181:158, 2002

94. Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV), Washington DC: American Psychiatric Association, 1994.

95. Brewin CR. British Journal of Psychiatry, 181:535, 2002.

ANNEXURES

ANNEXURE-1

INFORMATION SHEET

PURPOSE: You are being requested to participate in this study to analyze the varied psychological disorders following maxillofacial trauma.

PARTICIPANTS: In order to qualify for this study, the participant must be an individual with maxillofacial trauma between age group 18 to 60 years with no other associated life threatening injury.

PROCEDURE: You will complete questionnaires about various psychological disorders following trauma. Participation in this study is completely voluntary, and if there are any questions you do not want to answer, you are free to leave them blank. You may be asked to participate in follow up studies in 10 days, one month and 6 months in which you will complete same questionnaires. Completing the questionnaire in no way obligates you to participate in follow-up studies. You may require 03-05 minutes to complete each questionnaires/ scales.

Risks and benefits: There are no known risks or discomforts associated with the study. The results obtained may eventually develop awareness of the prevalence of the mental health problem following maxillofacial trauma and aid in requirement of the mental health services in maxillofacial trauma patients.

Voluntary Participation: Participation in this study is voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. The alternative to participate in this study is not to participate. What this means is that you can decide not to participate and are free to withdraw from the study at any time with no penalty. Withdrawal from the study will in no way prejudice your future interactions with the personnel administering or supervising the study or with the institution in which study is been done.

Confidentiality: All identifying information obtained from this study will be kept strictly confidential, except as may be required by law. Any information that could be used to identify you will be kept secured. Data files will not contain potentially identifying information. Upon written request, we will send you a summary of your scores on various questionnaires.

ANNEXURE-2

CONSENT TO TAKE PART IN THE STUDY

***Study Title*:** *The psychological disorders following the maxillofacial trauma.*

Participant's Name:

Date Of Birth/ Age in Years :

Address:

Phone number:

I_____ , son/daughter of _____

(Please tick boxes)

Declared that I have read the information sheet provided to me regarding this study and have clarified any doubts that I had. [ ]

I also understand that my participation in the study is entirely voluntary and that I am free to withdraw permission to continue to participate at any time without affecting my usual functioning in the institution. [ ]

I also understand that neither I, nor the investigators, will have any choice or knowledge of whether I will continue to be a part of the study. [ ]

I understand that I will not receive any personal benefits in participating in this study. [ ]

I understand that the study staff and institutional ethics committee members will not need my permission to look at data even if I withdraw from the study. I agree to this access. [ ]

ANNEXURE-2

I understand that my identity will not be revealed in any information released to third parties or published. [ ]

I voluntarily agree to take part in this study. [ ]

Name:

Signature:

Date:

Name of witness:

Relation to participant:

Date:

ANNEXURE-3

Pro forma

Name:

Age:

Sex:

Hospital number:

Marital Status:

Occupation:

Address:

Email:

Phone number:

Date of incidene:

Time of incidence:

Place of incidence:

ANNEXURE-3

Cause of incidence:

a]RTA: Four wheeler/ two wheeler/pedestrian/other modes

If four wheeler: Car/van/bus/lorry- WHETHER Seat belt worn or not

If two wheeler: Rider/.pillon passenger- WHETER Helmet was worn or not,

Type of helmet: open face /full face

b]Assault

c]Sports

d]Fall

e]Industrial/Animal/other causes

History of Alcohol consumption at time of incident: Yes/No

Any history of injury to other parts:

Details of face injuries:

Details of treatment underwent:

History of any previous trauma:

Travel Anxiety: Yes/No

GENERAL HEALTH QUESTIONNAIRE

GHQ-12

Please read this carefully:

We should like to know if you have had any medical complaints, and how your health has been in general, *over the past few weeks*. Please answer ALL the questions simply by underlining the answer which you think most nearly applies to you. Remember that we want to know about present and recent complaints, not those you had in the past. It is important that you try to answer ALL the questions.

Thank you very much for your co-operation.

HAVE YOU RECENTLY:

1 -	**been able to concentrate on whatever you're doing?**	Better than usual	Same as usual	Less than usual	Much less than usual
2 -	**lost much sleep over worry?**	Not at all	No more than usual	Rather more than usual	Much more than usual
3 -	**felt that you are playing a useful part in things?**	More so than usual	Same as usual	Less useful than usual	Much less useful
4 -	**felt capable of making decisions about things?**	More so than usual	Same as usual	Less so than usual	Much less capable
5 -	**felt constantly under strain?**	Not at all	No more than usual	Rather more than usual	Much more than usual
6 -	**felt you couldn't overcome your difficulties?**	Not at all	No more than usual	Rather more than usual	Much more than usual
7 -	**been able to enjoy your normal day-to-day activities?**	More so than usual	Same as usual	Less so than usual	Much less than usual
8 -	**been able to face up to your problems?**	More so than usual	Same as usual	Less able than usual	Much less able
9 -	**been feeling unhappy and depressed?**	Not at all	No more than usual	Rather more than usual	Much more than usual
10 -	**been losing confidence in yourself?**	Not at all	No more than usual	Rather more than usual	Much more than usual
11 -	**been thinking of yourself as a worthless person?**	Not at all	No more than usual	Rather more than usual	Much more than usual
12 -	**been feeling reasonably happy, all things considered?**	More so than usual	About same as usual	Less so than usual	Much less than usual

Published by GL Assessment Limited
389 Chiswick High Road, 9th Floor East, London W4 4AL, UK

This edition published 1992.

GL assessment
the measure of potential

GL Assessment is part of the Granada Learning Group

Code 0090002365 4(8.11)

Hospital Anxiety and Depression Scale (HADS)

GL assessment
the measure of potential

Name: Date: _

Clinicians are aware that emotions play an important part in most illnesses. If your clinician knows about these feelings he or she will be able to help you more.

This questionnaire is designed to help your clinician to know how you feel. Read each item below and **underline the reply** which comes closest to how you have been feeling in the past week. Ignore the numbers printed at the edge of the questionnaire.

Don't take too long over your replies, your immediate reaction to each item will probably be more accurate than a long, thought-out response.

FOLD HERE

FOLD HERE

A	D		A	D
		I feel tense or 'wound up'		
3		Most of the time		
2		A lot of the time		
1		From time to time, occasionally		
0		Not at all		
		I still enjoy the things I used to enjoy		
	0	Definitely as much		
	1	Not quite so much		
	2	Only a little		
	3	Hardly at all		
		I get a sort of frightened feeling as if something awful is about to happen		
3		Very definitely and quite badly		
2		Yes, but not too badly		
1		A little, but it doesn't worry me		
0		Not at all		
		I can laugh and see the funny side of things		
	0	As much as I always could		
	1	Not quite so much now		
	2	Definitely not so much now		
	3	Not at all		
		Worrying thoughts go through my mind		
3		A great deal of the time		
2		A lot of the time		
1		Not too often		
0		Very little		
		I feel cheerful		
	3	Never		
	2	Not often		
	1	Sometimes		
	0	Most of the time		
		I can sit at ease and feel relaxed		
0		Definitely		
1		Usually		
2		Not often		
3		Not at all		
		I feel as if I am slowed down		
		Nearly all the time		3
		Very often		2
		Sometimes		1
		Not at all		0
		I get a sort of frightened feeling like 'butterflies' in the stomach		
		Not at all	0	
		Occasionally	1	
		Quite often	2	
		Very often	3	
		I have lost interest in my appearance		
		Definitely		3
		I don't take as much care as I should		2
		I may not take quite as much care		1
		I take just as much care as ever		0
		I feel restless as if I have to be on the move		
		Very much indeed	3	
		Quite a lot	2	
		Not very much	1	
		Not at all	0	
		I look forward with enjoyment to things		
		As much as I ever did		0
		Rather less than I used to		1
		Definitely less than I used to		2
		Hardly at all		3
		I get sudden feelings of panic		
		Very often indeed	3	
		Quite often	2	
		Not very often	1	
		Not at all	0	
		I can enjoy a good book or radio or television programme		
		Often		0
		Sometimes		1
		Not often		2
		Very seldom		3

Now check that you have answered all the questions

A	D

ANNEXURE-6

TRAUMA SCREENING QUESTIONNAIRE

Please indicate whether not you have experienced any of the following atleast twice in the past week:

	YES	NO
1.Upsetting thoughts or memories about the event that have come into your mind against your will		
2.Upsetting dreams about the event		
3.Feeling as though the event were happening again		
4.Feeling upset by remainders of the event		
5.Bodily reactions(such as fast heartbeat, stomach churning,sweatiness,dizziness)when reminded of the event		
6.Difficulty falling or staying asleep		
7.Irritability or outbursts of anger		
8.Difficulty concentrating		
9.Heightened awareness of potential dangers to yourself and others		
10. Being startled at something unexpected		

C. R. Brewin, et al, 2002. (Used by permission)

MASTER CHART

Sl.no,	Age	Sex	Marital status	Occupation	DIAGNOSIS	Alcohol	MOI	Helmet	Seat Belt	GHQ-12(1st)	HADS-A(1st)	HADS-D(1st)	GHQ-12(2nd)	HADS-A(2nd)	HADS-D(2nd)	TSQ(2nd)	GHQ-12(3rd)	HADS-A(3rd)	HADS-D(3rd)	TSQ(3rd)
1	36	Male	Married	Labourer	Laceration upper lip and forehead	No	2 wheeler rider	NO		6	3	4	5	2	8	1	6	2	5	0
2	40	Male	Married	Unemployed	B/l Lefort's 1,Rt. Zygoma#,Mandible#, Laceration forehead	No	Passenger in Auto			6	2	1	5	2	1	1	5	2	1	1
3	38	Male	Married	Pharmacist	Eyebrow laceration, Zygoma#, Mandible#	Yes	2 wheeler rider	No		7	4	3	7	3	2	3	6	3	2	2
4	25	Male	Single	Student	B/l Lefort's 2 #	No	2 wheeler rider	No		8	4	2	3	2	2	0	2	2	1	0
5	43	Male	Married	Electrician	B/l Lefort's 2 #, Rt. Supraorbital laceration	No	2 wheeler rider	No		5	3	3	5	2	1	0	4	1	1	0
6	33	Male	Married	Labourer	Right Lefort's 3, lt.Lefort's 2 , Rt. supraorbital laceration	yes	2 wheeler rider	No		4	6	8	7	6	8	0	7	2	3	0
7	24	Male	Single	Unemployed	Multiple laceration	No	2 wheeler rider	No		4	3	2	4	3	1	0	4	2	1	0
8	28	Male	Married	Coolie	B/l Lefort's 1 Rt.Eyebrow laceration	Yes	2 wheeler rider	No		7	8	8	7	8	8	7	7	8	8	7
9	24	Male	Single	Student	B/l Lefort's 2 forehead laceration	Yes	2 Wheeler pillon	No		4	8	8	4	5	8	6	4	5	3	2
10	41	Male	Married	Private Service	Right eyebrow and nasal ala laceration	No	Four wheeler		No	0	4	3	4	0	1	0	4	0	0	0
11	22	Male	Single	Unemployed	Rt.Zygoma #, Right face abrasion	Yes	2 wheeler rider	No		7	2	8	7	2	8	1	7	2	4	1
12	27	Male	Single	Student	B/L Lefort's 2 #, Lt eyebrow laceration	Yes	2 wheeler rider	No		6	2	8	6	2	8	2	6	3	2	1
13	24	Male	Single	Unemployed	B/l Lefort's 1 #	Yes	2 wheeler rider	No		7	8	8	6	8	8	7	6	6	8	6
14	30	Male	Married	Village adm Officer	Multiple laceration	No	2 wheeler rider	No		11	3	4	10	3	3	1	10	3	3	1
15	46	MALE	Married	Driver	Forehead abrasion	Yes	Lorry driver		No	5	1	2	5	1	1	1	Absent	Absent	Absent	Absent
16	24	Male	Single	Student	Multiple face abrasion	Yes	2 wheeler rider	No		4	8	8	4	8	8	6	4	8	8	6
17	21	male	Single	Student	Multiple face laceration, B/l Lefort's 3 #	Yes	2 wheeler rider	No		5	8	8	5	8	8	6	5	8	8	6
18	43	Male	married	Clerik	Multiple laceration	No	2 wheeler rider	No		6	8	8	6	8	8	6	5	8	8	6
19	43	Male	Married	Labourer	Rt. Zygoma #	No	2 wheeler rider	No		6	8	8	5	8	8	7	5	8	8	6
20	24	Male	Single	Software pofession	B/l Lefort's 1#, Symphyseal mandible #	No	2 wheeler rider	No		5	10	8	5	9	8	6	5	10	4	6
21	55	Male	Married	Service	rt.Lefort 2, Lt. lefort3	No	2 wheeler rider	No		5	4	3	4	3	2	1	4	2	1	0
22	28	Male	Single	Coolie	Right eyelid laceration	No	2 wheeler rider	Yes		5	3	2	4	2	2	0	5	2	2	0
23	29	Male	Married	Employed	Left lefort's 2 with symphyseal mandible #	No	2 wheeler rider	No		6	2	3	4	2	8	2	6	2	6	2
24	40	Male	Married	Unemployed	B/l Lefort's 2 #	No	2 Wheeler rider	No		5	8	8	5	3	9	6	5	3	3	3
25	34	Male	Married	Buisnessman	B/l Lefort's 2 #	No	2 wheeler rider	no		4	2	3	4	3	3	1	4	2	3	1
26	36	Male	married	Driver	Lt. Zygoma #, Laceration lt. Nasal Ala and upper lip	No	2 wheeler rider	No		6	4	2	5	4	2	0	6	3	2	0
27	30	Male	Married	Farmer	Forehead laceration	No	2 wheeler rider	No		5	5	8	5	5	8	0	5	2	3	1
28	48	Male	married	Unemployed	Lt.Zygoma #	No	2 wheeler rider	No		8	3	6	7	2	8	1	6	2	5	1
29	28	Female	married	House wife	Rt.Zygoma #	No	2 wheeler rider	No		7	4	3	7	2	4	2	6	3	3	1
30	25	male	Single	Unemployed	Rt.Zygoma#	No	2 wheeler rider	No		6	8	8	6	5	8	6	6	4	8	3
31	65	Male	Married	Retired	B/l Lefort's 2# Mandible parasymphyseal #	No	2 wheeler rider	No		5	8	8	5	5	8	6	5	5	8	6
32	41	Male	married	Unemployed	Rt.Lefort's 2#, Lt.Lefort's1#	No	2 wheeler rider	No		7	3	2	6	2	2	0	5	2	1	0
33	60	Male	married	Unemployed	B/l Lefort's 3#	No	Pedestrian	No		7	3	4	6	2	2	3	6	2	1	2
34	24	Male	Single	Student	Upper lip laceration, abrasion right foehead	No	2 wheeler rider	No		8	8	8	7	4	8	6	7	4	8	3
35	30	Male	Single	Unemployed	Rt. Chin/ Preauricular Laceration	No	2 wheeler rider	No		6	2	3	5	2	3	0	5	2	2	0
36	22	Male	Single	Student	Lt. Eyebrow laceration	No	2 wheeler rider	No		5	3	4	3	2	4	1	2	2	2	0
37	28	Male	Single	Coolie	B/l Lefort's 2# Laceration dorsum of nose and infraorbital region	Yes	2 wheeler rider	No		6	5	3	3	3	2	0	3	2	2	0
38	26	Male	Single	Clerk	Laceration rt eyebrow, root of nose abrasion right periorbital region	Yes	2 wheeler rider	No		5	6	3	3	5	2	1	3	4	2	0
39	19	Male	Single	Student	Abrasion injury face	No	2 wheeler rider	No		2	3	2	4	2	1	0	4	1	1	1
40	25	Male	Single	Unemployed	Right cheek abrasion	No	2 wheeler rider	No		0	0	0	0	0	0	0	0	0	0	0
41	38	Male	Married	Employed	Rt.Zygoma, Parasymphyseal mandible #, Rt. Forehead laceration	Yes	2 wheere rider	No		5	0	2	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
42	19	Male	Single	Student	Laceration Rt. Pinna, Abrasion Rt. Cheek	No	2 wheeler rider	No		6	4	3	6	3	2	2	5	2	1	2
43	24	Male	Single	labourer	Cheek abrasion	Yes	2 wheeler rider	No		5	3	2	5	4	6	5	Absent	Absent	Absent	Absent
44	43	Male	married	Farmer	Forehead laceration	No	2 wheeler rider	No		5	0	1	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
45	34	Male	Married	Service	Forehead laceration	No	2 wheeler rider	No		5	0	5	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
46	25	Male	married	Unemployed	Forehead laceration	No	2 wheeler rider	No		9	4	5	8	4	4	0	7	4	3	0
47	37	Male	Married	Farmer	Left Lefort's2 with Rt. Lefort's 1	No	2 wheeler rider	No		8	5	6	8	5	5	4	7	3	3	3
48	19	Male	Single	Student	Cheek laceration	No	2 wheeler rider	No		6	3	5	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
49	37	female	Married	Housewife	Rt. eyebrow laceration	No	2 wheeler rider	No		5	2	5	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
50	35	Male	Married	labourer	Partial nose avulsion injury	Yes	2 wheeler rider	No		6	3	4	3	3	3	4	3	3	3	0
51	22	male	Single	labourer	Cheek and forehead contusion	Yes	2 wheeler rider	No		6	3	4	6	2	1	0	Absent	Absent	Absent	Absent
52	35	male	Married	Coolie	Rt Zygoma #, Rt Periorbital laceration	No	2 wheeler rider	No		6	4	3	5	0	1	0	Absent	Absent	Absent	Absent
53	19	Male	Single	Student	Supraorbital Avulsion injury	No	2 wheeler rider	No		4	1	2	4	1	1	1	Absent	Absent	Absent	Absent
54	29	Female	Married	Teacher	Forehead laceration	No	2 wheeler rider	no		7	4	5	5	3	4	2	Absent	Absent	Absent	Absent
55	30	Male	Single	Farmer	Forehead contusion		Bullock cart rider			4	3	4	4	4	6	1	4	3	3	1
56	28	Male	Single	Unemployed	Right forehead laceration, Rt. Zygoma #	Yes	2 wheeler rider	No		5	4	5	5	3	4	0	5	3	4	0
57	22	Male	Single	Labourer	Left cheek and upper eyelid avulsion injury	Yes	2 wheeler rider	No		1	1	3	1	1	2	0	0	1	1	0
58	22	Male	Single	Student	B/l Lefort's 3#	No	2 wheeler rider	No		4	3	1	4	2	1	1	4	2	1	0
59	35	Male	Married	Buisnessman	Avulsion of cheek	No	2 wheeler rider	No		6	4	2	5	3	2	0	6	3	2	0
60	25	Male	Single	Student	Lt. Eyebrow laceration	Yes	2 wheeler rider	No		8	2	1	6	1	1	0	5	0	0	0
61	24	Male	Single	Labourer	Nose laceration	No	2 wheeler rider	No		4	1	2	3	1	2	0	3	1	1	1
62	58	Male	Married	Employed	Lt. cheek contusion	No	2 wheeler rider	No		7	1	0	6	0	0	0	6	0	0	0
63	19	Male	Single	Student	One third upper lip avulsion injury	No	2 wheeler rider	No		6	10	9	5	8	8	7	5	8	9	6
64	22	Male	Single	unemployed	Left eyebrow laceration	No	2 wheeler rider	No		0	1	2	0	0	1	0	0	0	1	0
65	20	Male	Single	Student	Lt. Eyebrow avulsion		Sports(football)			1	3	2	0	2	1	0	0	2	1	0
66	53	Male	Married	Employed	Lt. Zygoma #,	No	2 wheeler rider	No		0	0	0	0	0	0	0	0	0	0	0
67	19	Male	Single	Student	Laceration over nose and upper lip	No	2 wheeler rider	No		3	4	6	2	4	5	1	Absent	Absent	Absent	Absent
68	53	Male	Married	Retired	Lt. Supraorbital laceration	No	4 wheeler		No	0	4	5	0	2	3	0	0	2	2	0
69	22	Male	Single	Farmer	Rt. Forehead laceration	No	2 wheeler rider	No		4	0	0	4	0	0	0				
70	36	Male	Married	Labourer	rt. cheek and temporal forehead laceration	Yes	2 wheeler rider	No		4	3	2	4	2	3	0	4	3	2	0
71	21	Male	Unmarried	Student	Rt Zygoma#	No	2 wheeler rider	No		9	4	3	8	3	4	1	7	3	4	0
72	19	Female	Unmarried	Student	Lt. Infraorbital avulsion injury	No	Autorickshaw			6	2	4	3	2	3	4	3	1	2	4
73	40	Male	married	Bus conductor	Multiple laceration	No	2 wheeler rider	No		6	1	2	5	2	1	0	5	1	1	0
74	35	Female	Married	Coolie	Multiple face contusion	No	Pedestrian			5	2	1	4	2	1	2	4	2	1	1
75	35	Male	Married	Labourer	Laceration rt eyebrow, malar eminence	No	2 wheeler rider	No		6	6	5	4	5	5	3	3	4	4	2
76	29	Male	Single	Sub Inspector	Laceration rt supraorbital region, lt upper lip and chin	No	2 wheeler rider	No		5	5	4	4	5	3	2	2	4	3	1
77	31	Male	Married	Labourer	Left nasal bone# lt. eyelid laceration	No	2 wheeler rider	No		7	8	9	5	8	8	6	5	7	7	6
78	33	male	married	Driver	Lt Zygoma # with left bdy mandible #	No	2 wheeler rider	No		6	9	8	6	8	7	7	6	8	7	6
79	52	Male	Married	Farmer	Rt Lefort3, Lt Lefort2 ,Rt.Symphyseal mandible fracture	No	2 wheeler rider	No		8	9	9	7	9	6	7	6	8	5	5
80	53	Male	Maried	Farmer	Rt. Lefort3 Lt Lefort1#	No	2 wheeler rider	No		5	10	9	4	8	8	6	3	7	7	6
81	31	Male	Single	Software pofession	Lt Lefort1 saggittal palate split Lt Zygoma#	No	4 wheeler		No	7	8	8	6	9	7	10	5	8	7	8
82	29	male	Single	Unemployed	Rt zygoma# Rt mandible angle #	No	2 wheeler rider	No		5	9	8	5	8	9	7	5	7	8	7
83	30	Male	Married	Police constable	Rt Zygoma#	No	2 wheeler rider	No		5	10	9	4	9	6	5	3	8	5	4
84	49	Male	Married	Meat Seller	Upper lip laceration	Yes	2 wheeler rider	No		4	5	3	4	4	3	0	3	2	2	0
85	36	Male	Married	Clerk	Right lower lid avulsion	No	2 wheeler rider	No		3	4	3	2	3	2	1	2	2	1	0
86	23	Male	Single	Student	Cheek laceration	No	2 wheeler rider	No		1	2	1	2	2	2	0	1	2	1	0